

THE INDUSTRY'S RECOGNIZED AUTHORITY

# ROCK PRODUCTS

CEMENT • SAND AND GRAVEL • CRUSHED STONE • SLAG • LIME • GYPSUM  
READY-MIXED CONCRETE • CONCRETE PRODUCTS • INDUSTRIAL MINERALS

SEPTEMBER  
1944

## IN THIS ISSUE

Making Agstone from Gravel  
Convert Quarries to Mines  
Controlling Quality of Concrete  
Well Designed Plant Cuts Costs  
Mexico's Cement Production Problem  
New Pipe Manufacturing Process

COVER: Ohio Gravel Co., deposit from  
which agstone is produced

*Per*  
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CONGRESS  
SERIALS ACQUISITION

OCT 17 1944

*Gravel Pebbles from this Deposit  
Pulverized into Lining Materials*

OCT 13 1944

# ELIMINATE COSTLY SLEDGING



**WILLIAMS "SLUGGER"**  
CRUSHES ONE MAN SIZE STONE TO 1 1/4",  
3/4" OR AGSTONE IN ONE OPERATION

With the Williams "Sluggger" Crusher and Pulverizer it is possible to crush large pieces of stone weighing from 75 to 100 pounds to 1 1/4", 3/4" or agricultural limestone in ONE OPERATION. This not only eliminates sledging but also does away with the unnecessary expense of a primary crusher.

Open view of the "Sluggger" Crusher showing heavy duty hammers, liners and discs.

The "Sluggger" represents the most advanced type of crushing equipment on the market today. With seven sizes to choose from, producing from 4 to 30 tons per hour, every producer can profitably install a Williams.

## WILLIAMS FINE GRINDING EQUIPMENT WITH AIR SEPARATION

For faster, more efficient fine grinding of limestone, lime, coal, talc, etc., there is a Williams Roller Mill with Air Separation to fit your requirements. Finenesses from 100 to 400 mesh. Williams also builds Impact Mills with Air Separation; Mechanical Air Separators for classifying finely ground material or taking the fines out of dry material.



Write Today for  
Bulletin 621

## OUTSTANDING "SLUGGER" FEATURES

### MANGANESE STEEL HAMMERS

Heavy duty slug end hammers are standard equipment in the "Sluggger."

### STEEL FRONT END

The part which holds the breaker plate is a steel casting—3 1/2 times stronger than cast iron.

### HAMMER ADJUSTMENTS OVER-COME WEAR

Discs are arranged so that the hammers can be set out as they wear on the end.

### MANGANESE STEEL ADJUSTABLE BREAKER PLATE

Adjustable towards the hammers.

### COVER LINERS 1" THICK

Manganese steel liners.

### SIDE LINERS 1" THICK.

Manganese steel liners.

### SEVEN SIZES

30 to 150 horsepower, stationary or portable models.

## WILLIAMS PATENT CRUSHER & PULVERIZER COMPANY

800 St. Louis Avenue

St. Louis 6, Mo.



REG. U.S. PAT. OFF.

**WILLIAMS**  
OLDEST AND LARGEST BUILDERS OF HAMMERMILLS IN THE WORLD  
**WILLIAMS**  
PATENT CRUSHERS GRINDERS SHREDDERS



# LINK-BELT

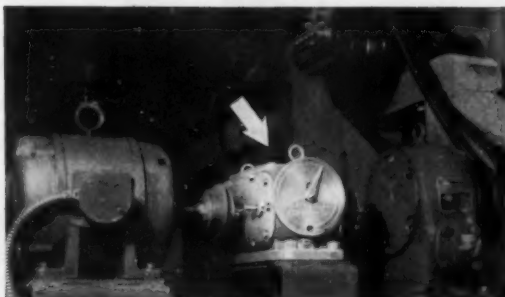


MATERIALS HANDLING AND POWER TRANSMISSION MACHINERY

## SERVES THE ENTIRE INDUSTRY



**BELT CONVEYORS** perform a very important job at this mine in keeping zinc-lead ores "on the move." Link-Belt designs offer the best in belt conveyor equipment.



**P.I.V. GEAR VARIABLE SPEED CHANGERS** accurately control speeds of conveyors, feeders, ball mills, etc.



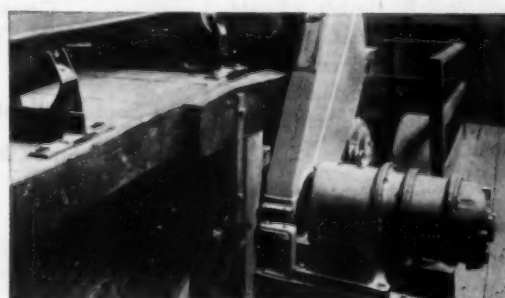
**VIBRATING SCREENS** assure high efficiency and low-cost operation on both liquid and dry screening applications.



**SORTING-TABLE FEEDER-CONVEYOR** handling ore from mine to crusher—one of the many types of Link-Belt Feeders in service in the mining industry.



**ROTARY MINE CAR DUMPER** on 900-ft. level dumping a 6-ton ore car into bin over primary crusher.



**MOTORIZED SPEED REDUCER** and **ROLLER CHAIN DRIVE** operating head shaft of belt conveyor.

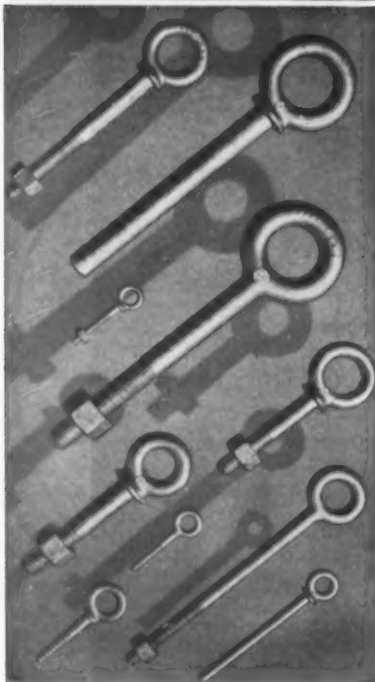
**LINK-BELT EQUIPMENT INCLUDES:** Complete Sand, Gravel and Stone Washing Plants . . . Ready-Mixed Concrete Plant Equipment . . . Lime Handling Equipment . . . Screens (vibrating, rotary and conical) . . . Washers and Classifiers, of the screw, log, flight, Shaw and conical types . . . Dewatering Rotoconveyors and Screw Conveyors . . . All Types of Elevators and Conveyors . . . Roto-Louvre Dryers and Coolers . . . Skip Hoists . . . Car Spotters and Haulage Systems . . . Portable Conveyors and Bucket Loaders . . . Silent and Roller Chain Drives . . . Speed Reducers . . . Variable Speed Transmissions . . . Chains (Malleable Iron, Promal and Steel) . . . Sprockets . . . Elevator Buckets . . . Gears . . . Clutches . . . Couplings . . . "Friction Fighter" Self-Aligning Ball and Roller Bearing Units . . . Babbitted Bearing Units, etc.

As specialists in the design, manufacture and application of materials handling and power transmission machinery for all industry, Link-Belt engineers have learned how to apply an extensive knowledge and experience, effectively, to the solution of all kinds of materials handling and power transmitting problems. Because Link-Belt makes many types of conveyors, chains and power transmitting machinery, we can be of incalculable service in recommending the equipment most certain to aid in attaining efficient production.

**LINK-BELT COMPANY**

Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Dallas 1, Minneapolis 5, San Francisco 24, Toronto 8.  
Offices in principal cities.

**SPECIALS WASTE TIME  
...TRY LAUGHLIN'S  
STANDARD LINE  
EYE BOLTS  
FOR ALL JOBS**



Keep your eye on this picture if you're thinking of having special bolts made up. Every minute counts! Laughlin standard eye bolts will likely fill the bill. All weldless—all drop forged steel. Nut type with extra length threads for extra adjustment. Send for latest Laughlin Catalog showing standard stock eye bolt sizes in nut, screw and rivet types.

Distributed through  
Mill, Mine, and Oil Field Supply Houses

Look for Laughlin Products in  
Pit & Quarry Handbook

Write for Latest Catalog on Laughlin  
Industrial Hardware

**FORGING A SHARE IN VICTORY**



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SEPT. 1944  
VOL. 47 • NO. 9

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**BETTER CEMENT  
AND MORE OF  
IT PER DAY  
AT LOWER  
COST PER TON**



*when you put a **BIRD** like this  
in your grinding circuit*

Try close circuit grinding with this BIRD Continuous Centrifugal CLASSIFIER handling the slurry with the clay already added.

It takes the slurry at tube mill consistency, delivers the fines direct to the kiln just right for most efficient burning and permits return of oversize for regrinding. The grinding operation is close circuited. Increased capacity, re-

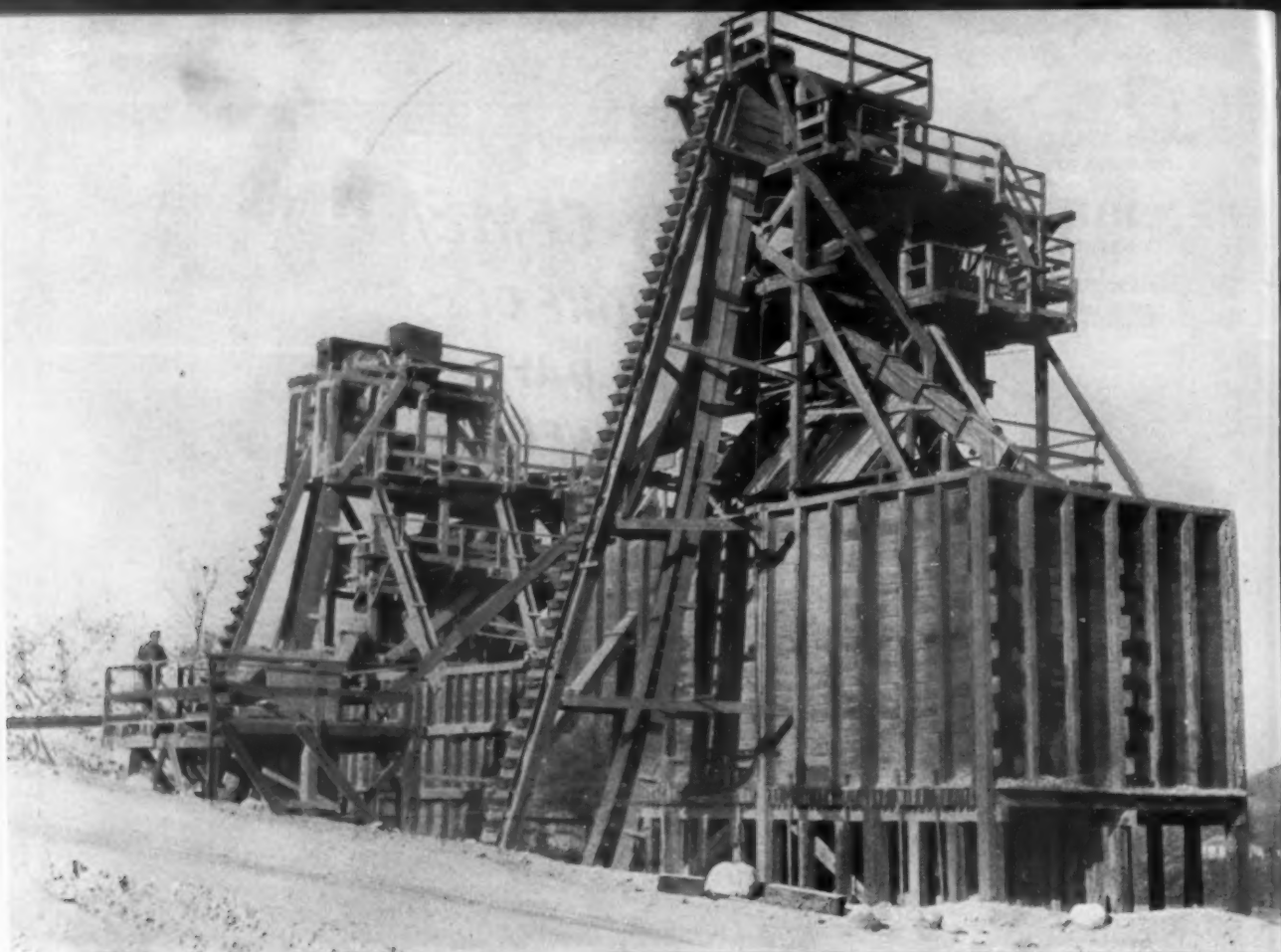
duced grinding cost and improved kiln operation are assured.

A BIRD Classifier handling 5000 barrels a day takes up only 13½ x 10 ft. Installation is easily and inexpensively made without interrupting production. Why not get the whole story on what this BIRD can do for you, *now*, while you have time to turn around?

**BIRD MACHINE COMPANY**  
SOUTH WALPOLE • MASSACHUSETTS

**BUILDERS OF BIRD CONTINUOUS CENTRIFUGAL FILTERS**

ROCK PRODUCTS, September, 1944



The photo shows a western rock and gravel plant, equipped with S-A Material Handling Equipment including belt conveyors, VIBRATOR Screens, etc.

## *Teamed Up*

### For Peak Handling Efficiency

#### **S-A Engineering and Equipment**

To work with Stephens-Adamson on your rock or aggregate handling problems means to take advantage of this hard-hitting team of favorable factors:

(1) Engineering—the ability to design the exact system your operations require to assure peak efficiency.

(2) Equipment—the exact machinery needed to put a planned layout into operation—available from S-A's complete line of elevators, conveyors, feeders, crushers, screens, transmission machinery, etc.

(3) Experience going back 43 years, years of specializing in solving handling problems.

Take advantage of these factors—talk over your problems with an S-A engineer. Write us.

# STEPHEN S-A DAMSON

7 RIDGEWAY AVENUE, AURORA, ILLINOIS

MFG. CO.

LOS ANGELES, CALIF. ★ BELLEVILLE, ONT.

*Designers and Manufacturers of All Types of*  
**BULK MATERIAL HANDLING EQUIPMENT**






## Where flour dust is dynamite

*A typical example of B. F. Goodrich development in rubber*

**F**LOUR dust can be highly explosive. When anything that burns is broken into fine particles and mixed with the right amount of air, a single spark can cause an explosion.

Millers did everything possible to keep out of their plants anything that might cause sparks, but the greatest danger came from belts used to drive their machines. A running belt frequently built up static electricity. Because rubber wouldn't conduct electricity, the current would build up until the charge was strong enough to jump to some conductor — jump and spark.

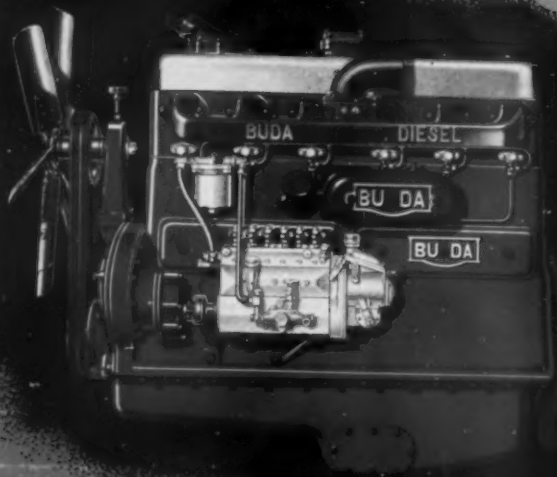
Flour men were afraid of this danger and came to B. F. Goodrich for help. They found that B. F. Goodrich research men had already changed the very nature of rubber by developing a compound that *carries* electricity — the current flows through the rubber and is carried away. Belts made of this material — with *one billion times* the ability of ordinary rubber to carry electricity — have been protecting powder and chemical plants from explosions for several years. Static-conducting belts like those in the picture were installed in the flour mills and immediately ended threats of explosion.

There are many new B. F. Goodrich developments you may not know of that might solve a problem for you. And there have been many improvements in older products. For B. F. Goodrich research is continuous, on old products as well as new. If you have a problem that might be solved by rubber — natural or synthetic — write *The B. F. Goodrich Company, Industrial Products Division, Akron, Ohio.* 

**B.F. Goodrich**

*RUBBER and SYNTHETIC products*

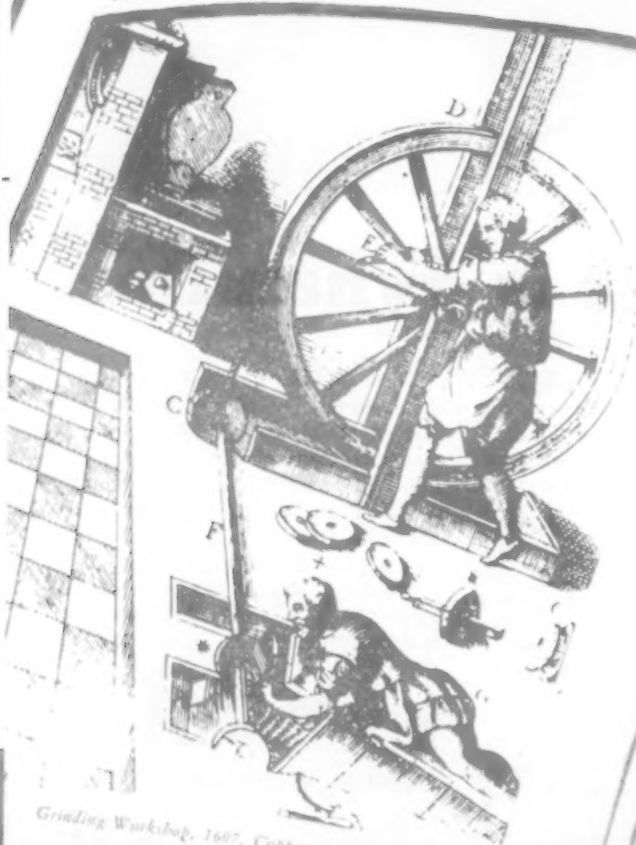
**BUDA**  
Service is  
Nation-Wide



# Power...

precedes progress

Hettman Archive



Grinding Workshop, 1607. Copper engraving.

**T**he slow, tedious, laborious work of grinding metals in the 16th century is a far cry from the speedy, efficient methods common to our time. Progress made in the development of modern Diesel power was the forerunner of our modern equipment.

Today you can have the finest, most efficient, economical power ever developed, by specifying BUDA Diesels.

Write or wire for literature.

# BUDA

15428 Commercial Avenue  
HARVEY (Chicago Suburb) ILLINOIS



# Rotary Kilns Coolers • Dryers



SHIPMENT OF THE COMPLETE SHELL OF A 7' 0" DIA. X 125' 0" TRAYLOR ROTARY KILN

## WE BUILD

Rotary Kilns  
Rotary Coolers  
Rotary Dryers  
Rotary Slakers  
Scrubbers  
Evaporators  
Jaw Crushers  
Gyratory Crushers  
Reduction Crushers  
Crushing Rolls  
Grinding Mills  
Ball Mills  
Rod Mills  
Tube Mills  
Pug Mills  
Wash Mills  
Feeders  
Rotary Screens  
Elevators

To convey an idea of the widespread utility and distribution of Traylor Rotary Kilns, Coolers and Dryers, it may be mentioned that the hundreds of these units now in use are located as follows: In the Cement industry, in 17 states and 8 foreign countries; Lime manufacture, in 7 states; Paper Mills, in 4 states; Chemical plants, in 12 states and 4 foreign countries; Aluminum plants, in 5 states and 2 foreign countries; in the Metal Mining industry, in 11 states and 4 foreign countries. In

addition, scores of units in miscellaneous industries on four continents.

In the list of users are found the names of the nation's and the world's leaders in the various industries mentioned. This fact is significant, because leadership is gained through the efficiency attained by the use of only the highest type of equipment. We feel that Traylor has been recognized as contributing measurably to the success of these leaders, by reason of the fact that our equipment is so extensively used.

**GET OUR BULLETIN No. 115**

# TRAYLOR

**ENGINEERING & MANUFACTURING CO.**  
MAIN OFFICE AND WORKS — ALLENTOWN, PENNA., U.S.A.

NEW YORK CITY  
3416 Empire State Bldg.

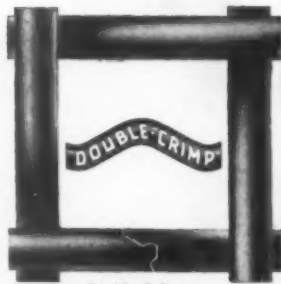
CHICAGO  
2051 One La Salle St. Bldg.

SALT LAKE CITY  
101 West Second South St.  
B. C. EQUIPMENT CO., LTD.  
551 Howe St., Vancouver, B. C.

LOS ANGELES  
919 Chester Williams Bldg.

SPOKANE  
S. 2707 Rhyolite Rd.

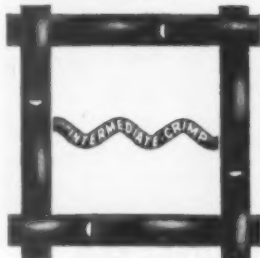
Export Department—104 Pearl St., New York City. Foreign Sales Agencies: London, Lima, Rio de Janeiro, Buenos Aires, Santiago, Antofagasta, Oruro, Montevideo, La Paz



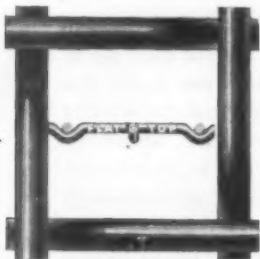
Double-Crimp



Arch-Crimp



Intermediate-Crimp



Flat-Top

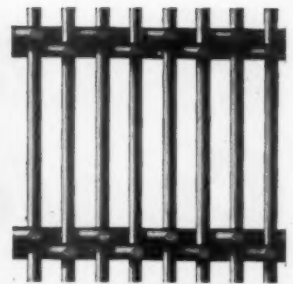
# "The Perfect"

## Wire Cloths and Screens

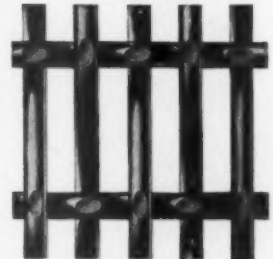
OF  
**SUPER-LOY  
STEEL**

**GALVANIZED STEEL  
STAINLESS STEEL  
NICKEL-CHROME STEEL  
PHOSPHOR BRONZE  
BRASS  
COPPER  
MONEL  
NICKEL  
ALUMINUM**

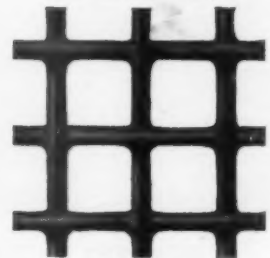
**ANY SPECIAL METAL FOR  
ANY SERVICE**



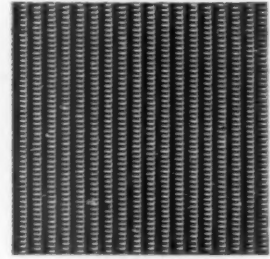
Straight Warp Rek-Tang



Calendered Rek-Tang



Galvanized



Dutch Weave

### "Perfect" WEAVES

**ARCH-CRIMP**  
Coiled  
**DOUBLE-CRIMP**  
**DOUBLE-FILL**  
**DUTCH**  
**FLAT-TOP**  
Twilled  
**INTERMEDIATE-CRIMP**

**REK-TANG**  
Selvage-Edge  
**STRAIGHT-WARP**  
Stranded  
**STA-TRU**  
Triple-Warp  
Twilled  
Twisted-Fill  
Twisted-Warp

### "Perfect" PROCESSING

Arc-Welding  
Bending  
Binding  
Brazing  
**CALENDERING**  
Colling  
Crimping

Cutting  
Dipping  
Dishing  
Finishing  
Flanging  
Flattening  
Forming  
Framing

**GALVANIZING**  
Jointing  
Knuckling  
Painting  
Rolling  
Selvaging  
Shaping

Shearing  
Slitting  
Soldering  
Spot-Welding  
Squaring  
Stitching  
Tack Welding  
Trimming

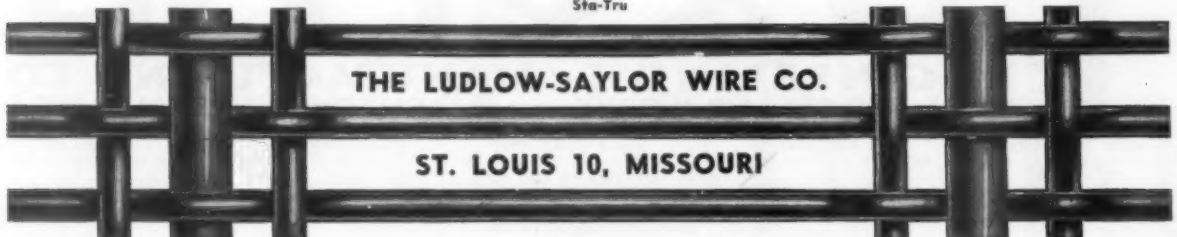
### "Perfect" PRODUCTS

Baskets  
Circles  
Coils  
Cones  
Cylinders  
Discs  
Forms  
Leaves  
Lengths

Panelis  
Pieces  
Ribbons  
Rings  
Rolls  
Sections  
Segments  
Strips  
Templates

Illustrations show items listed in capital letters. Other wire cloths and screens will be illustrated in subsequent advertisements of this series.

Sta-Tru



**THE LUDLOW-SAYLOR WIRE CO.**

**ST. LOUIS 10, MISSOURI**





*A Complete Line*

## NATIONAL EXPLOSIVES - A COMPLETE LINE OF EXPLOSIVES FOR CEMENT, LIMESTONE, TRAP ROCK, AND THE ENTIRE NON-METALLIC INDUSTRY

THE TABLE SHOWN INDICATES THE PROPERTIES OF NATIONAL DYNAMITES, GELATINS  
AND FLOW-FREE POWDERS

Type	Brand	Weight Strength %	Cartridge Strength %	Av. No. 1 1/4" x 8" Crgs. Per 100 Lbs.	Rate of Detonation, Ft. Per Sec.	Consistency
Straight Dynamite	Straight Dynamite	15 to 60	15 to 60	208 to 220	7000 to 21000	Cohesive
Straight Gelatin	Straight Gelatin	.....	20 to 100	174 to 204	8500 to 24000*	Very Plastic
Ammonia Dynamite	Standard Dynamite	15 to 60	15 to 60	216 to 220	6500 to 13000	Cohesive
Ammonia Gelatin	Standard Gelatin	.....	30 to 80	180 to 208	8500 to 24500*	Very Plastic
High Ammonia Content, Dynamite	Delomite 2 to 7	65	48 to 17	240 to 350	11500 to 8800	Cohesive
	Delomite 2 S to 6 S	65	48 to 21	240 to 330	7900 to 6500	Cohesive
Free Flowing	Flo-Free Bag 1 and 4	15 to 40	.....	8 (12 1/2 lb.) Bag	3900 to 4800	Free-Flowing
High Ammonia Content, Dynamite	Delomite Bag No. 5 FF	65	.....	8 (12 1/2 lb.) Bag	5000	Free-Flowing
Semi-Gelatin	Tungite 1 and 2	65	56 and 47	220 to 240	13000	Plastic
Special Ammonia Types	Special 2A, B, D, H	61 to 65	15 to 20	290 to 340	5600 to 8950	Cohesive

Millions of pounds of these Explosives are being used annually by the Non-Metallic Trade.



\*The higher rates of detonation of gelatins occur when 60% Straight Dynamite primer is used, or when charge is closely confined in bore hole.

NOTE: Straight = Nitroglycerine. Standard = Ammonia.

"Not Living on Our Reputation but Building It"

# NATIONAL POWDER COMPANY

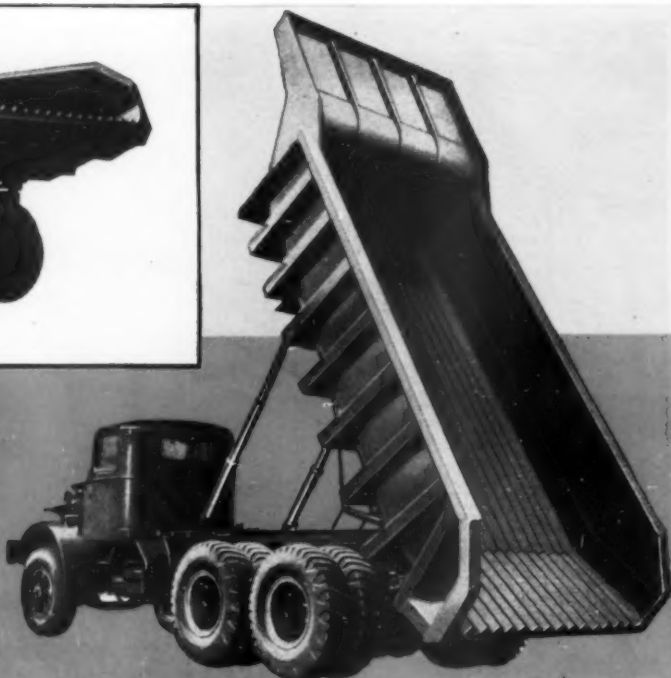
ELDRED (McKean County) • PENNSYLVANIA



Body with open or scapp end  
(Right) Same body elevated.

# **X-112 BODIES and T-4440 HOISTS**

## **for OPEN PIT MINING**



Body with automatic  
downfold tailgate.

Fleets of Trucks, equipped with Gar Wood X-112 Bodies and T-4440 Hydraulic Hoists, are hauling the biggest loads ever moved by trucks on production schedules. Lower mining costs have been made possible by speeding up the handling of overburden, ore and coal.

### **SPECIFICATIONS**

**HOIST**—Hydraulic, twin cylinder, telescopic.

**PUMP**—Gear type with aluminum wear-plates.

**POWER-TAKEOFF**—2-gear single speed.

**BODY**—Heavy duty with pressed-steel, box-type side braces and cross members.

**BODY SHELL**— $\frac{1}{4}$ " sheet steel with 2" wood filler.

**WEARPLATE**— $\frac{1}{4}$ " with floor angles or  $\frac{1}{8}$ " without. Longitudinals 8-inch "H" beams.

**CAB SHIELD**— $\frac{1}{4}$ " plate.

**FLOOR ANGLES**—Optional.



Automatic gate  
opens as body  
elevates.



## **GAR WOOD INDUSTRIES, Inc., Detroit 11, Michigan**

BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

**WORLD'S LARGEST MANUFACTURERS OF TRUCK AND TRAILER EQUIPMENT**



## How We Harnessed a Magnet to Eliminate Wear

Where there is no mechanical contact between moving parts, no wear can take place. This is the principle which P&H uses to transmit power for hoisting the dipper of the new P&H Electric Shovel. . . . The *Magnetorque Drive* transmits torque by electro-magnetic forces rather than by mechanical contact. Designed specifically for Electric Shovel operation, it eliminates motor commutation problems, sliding gears, mechanical clutches and other complicated mechanisms. Reversing the hoist motor is no longer necessary. Hoisting is completely independent of all other operations.

The *Magnetorque Drive* is typical of the advanced engineering and simplicity embodied in every detail of the new P&H Electric Shovel. Write for full information about the new P&H Electric Shovels.



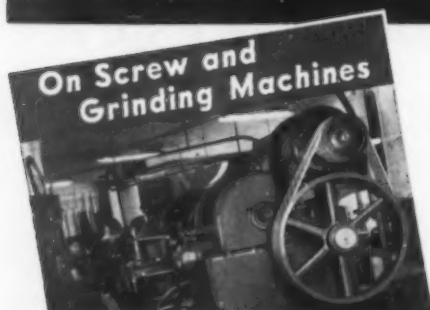
THE GREATEST FORWARD STEP EVER MADE IN ELECTRIC SHOVEL DEVELOPMENT



For **MORE** *than*  
**6 YEARS . . .**



# GATES *Synthetic Rubber* V-Belts



**—and HUNDREDS of Others**

—Have Been ***OUTWEARING***  
Any ***NATURAL RUBBER*** Belts Ever Used!

More than 6 years ago Gates began supplying American Industry with thousands upon thousands of V-Belts made entirely of synthetic rubber.

This was long before synthetic rubber came to be used merely as a substitute for natural rubber—in fact, Gates chose a very special synthetic rubber for the one reason that it is, in many important respects, greatly superior to natural rubber.

\* There are, of course, many kinds of synthetic rubber. Gates uses each kind where it best meets some particular service need.

For example:—one special synthetic rubber which Gates uses extensively in making V-Belts has the ability to withstand oil and heat much better than natural rubber can. Where oil and heat conditions are especially severe, Gates special synthetic V-Belts are giving 3 times to 4 times the service life of any natural rubber V-Belts ever used.

This is the record not of a few belts over a limited period but of thousands upon thousands of Gates synthetic rubber V-Belts installed in hundreds of plants and factories during the past 6 years.

Today, as you know, all industry depends on belts made of synthetic rubber—and that is exactly why Gates' long head-start in fabricating belts of synthetic rubber is so important to you **NOW!**

By simply picking up your phone and calling the Gates Rubber Engineer, you can now have, in your own plant, the full benefits of Gates' greater knowledge and experience—a distinct advantage to you in longer belt life and in trouble-free operation.

**THE GATES RUBBER COMPANY**  
Engineering Offices and Stocks in All Large Industrial Centers

# GATES VULCO ROPE DRIVES

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**DALLAS, TEXAS**  
2213 Griffin Street

**SAN FRANCISCO, CAL.**  
1090 Bryant Street



# POSTWAR PLANNING HEADQUARTERS

## *Your* Nearby A-W Distributor

TO HIS primary wartime job of keeping construction machinery in fighting trim... a job he has demonstrated his ability to bring to a successful conclusion... the Equipment Distributor is adding a new job... and a mighty pleasant one... that of helping his customers and friends plan for postwar.

Many developments are still under cover, but information on new and improved machines is beginning to reach the distributor from the manufacturer... information that will lead to more efficient highway department operating practices... to added profit for the contractor.

More than ever, your Austin-Western distributor is a good man to know.

**AUSTIN-WESTERN COMPANY, AURORA, ILLINOIS, U. S. A.**

Portland, Oregon, office and service warehouse of Columbia Equipment Company—leading distributor of A-W and allied equipment in the Pacific Northwest.



# I'M THE GUY WHO HAD TO BE SOLD ON HARD-FACING TRACTOR ROLLERS!



I FIGURED THIS WAY...

*"Stoody Self-Hardening was so much harder than steel it would probably chip."*

WRONG! Under all but the most adverse conditions, Stoody Self-Hardening will wear smoothly, without chipping or spalling. If operating conditions are ever sufficiently severe to cause failure of Stoody Self-Hardening, high carbon steel deposits would likewise fail.



SO I ARGUED...

*"O.K., maybe it won't chip but if Stoody Self-Hardening is so hard, it'll probably increase rail wear."*

DON'T believe it—Stoody Self-Hardening has a much lower coefficient of friction than any ordinary steel, including high carbon! If hard-facing is applied evenly to rollers and concentricity is maintained, actually less rail wear occurs because of reduced friction.



THEN I MUMBLED...

*"Well—even though roller chipping and rail wear are out, Stoody Self-Hardening's harder than heck to grind!"*

CERTAINLY it's hard to grind—grinding is abrasion, and this test simply proves our point: that Stoody Self-Hardening is far more abrasion resistant than ordinary steel or the best high carbon that money can buy. But don't let this stop you—Stoody Self-Hardening

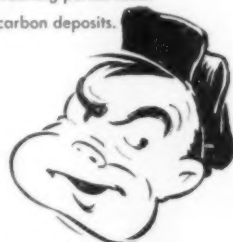
can be applied much more evenly and smoothly than high carbon electrodes. If

care is taken to eliminate hills and valleys in the deposit—and fair roller concentricity is maintained—grinding can be entirely eliminated! Or, if grinding of rollers is considered necessary, the smoother and more even deposits of Stoody Self-Hardening permit finishing of rollers as quickly as the rougher high carbon deposits.

SO I SHOT MY LAST ARGUMENT...

*"How about cost?"*

STOODY Self-Hardening costs 50¢ per lb. f.o.b. Whittier, California, or distributor's warehouse. But—Stoody Self-Hardening outwears the best high carbon steel electrodes by 2 to 1 or more! 1) Stoody Self-Hardening doubles the roller life, 2) the tractor owner eliminates one rebuilding job and 3) he saves the expense of tearing down the frame and pulling the rollers an extra time—Aren't these savings worth far more than the few cents' difference in cost between high carbon and long wearing Stoody Self-Hardening?



Stoody Self-Hardening is available in coated and bare rods for D. C. electric application from 600 United States distributors. 75 lbs. is ample to hardface 12 rollers on a large tractor. Place a trial order today and prove to yourself Stoody Self-Hardening's advantages.



**STOODY COMPANY**

1129 WEST SLAUSON AVENUE, WHITTIER, CALIFORNIA

**STOODY HARD-FACING ALLOYS**  
*Retard wear... Save Repair*



# "Delivering the Goods"

## FOR VICTORY!

Hunger—the "silent enemy"—is daily defeated through the ceaseless efforts of the American farmer and miller. Heavy-duty Multiwalls carry precious flour, sugar and other foodstuffs to mess kitchens serving our fighting men all over the world . . . to emergency canteens feeding war-weakened civilians in liberated countries . . . and to the bakeries in your town.

*"Give Us This Day  
Our Daily Bread!"*

Multiwall Paper Bags are required for industrial shipments of food products, chemicals, fertilizers, and construction materials — for domestic use and overseas to our armed forces and civilian populations of allied nations and occupied countries.



MULTIPLY PROTECTION • MULTIPLY SALEABILITY

**ST. REGIS PAPER COMPANY**

TAGGART CORPORATION

NEW YORK 17: 230 Park Ave.

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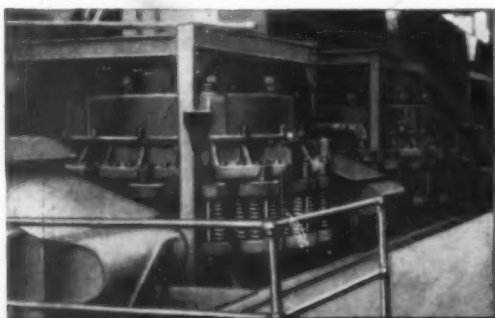
BATES VALVE BAG CO., LTD.  
Montreal, Quebec  
Vancouver, British Columbia

Boston, Mass.  
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Los Angeles, Calif.  
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New Orleans, La.  
Nazareth, Pa.

Denver, Colo.  
Toledo, Ohio



**METALS**



**GRAVEL**

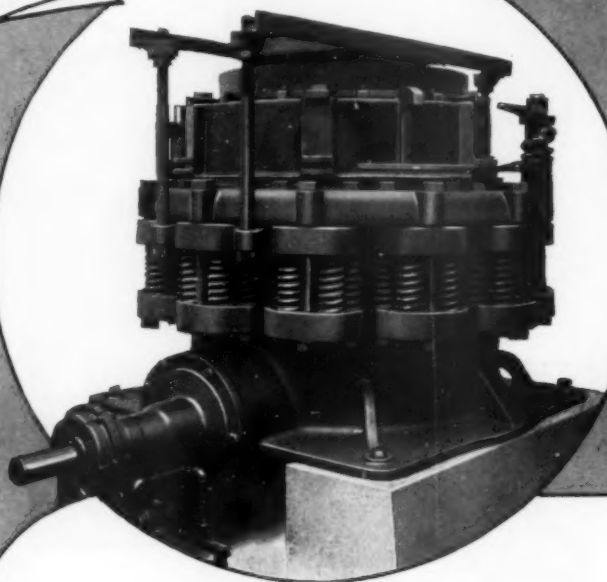


**STONE**



**SLAG**

*For Finer Crushing  
For All Materials*



Wherever extremely fine crushing is involved, whether for the recovery of metals or for making materials for airports, roads or other types of construction, the Symons Cone will deliver a more finely crushed product, in greater quantity and at lower cost than can be attained by any other method of crushing. That Cones are being used for most of the larger operations where fine crushing is being done is evidence of advantages found only in this machine.

**NORDBERG MFG. CO.**  
MILWAUKEE 7, WISCONSIN

NEW YORK • LOS ANGELES • LONDON • TORONTO



**SYMONS CONE CRUSHERS**



35-Ton Diesel-Electric Locomotive for Difficult Operating Conditions

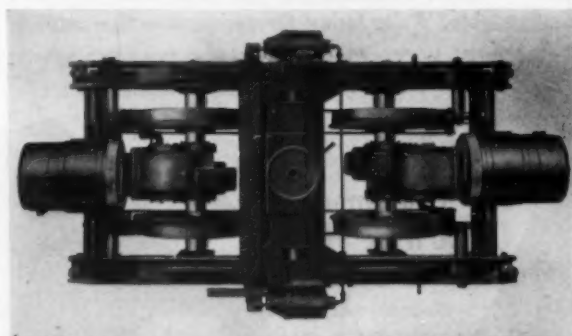


## CUSTOM BUILT

High up in the Andes Mountains of South America a great Copper Company hauls ore approximately 30 miles, from mine to smelter, over a 30"-gauge railway which twists and turns and tunnels through the solid rock, at grades often greatly exceeding the average climb of 7% from end to end of the route. And the job of designing a Diesel-electric locomotive to haul heavy loads, year in and year out, under these difficult conditions was further complicated by the fact that their track gauge is to be widened at the first suitable opportunity.

Vulcan's effective answer to this problem is given in the accompanying illustrations and working data. Note the extra power and high gear-ratio, which permits sustained operation with heavy loads at relatively high speed—the short truck-wheelbase which provides for sharp curves—the minimized height and width, for easy passage through tunnels; and the ample provision for widening the track gauge from the present 30" to as much as 56½".

NOW is the time to work out engineering problems, so that delivery of new equipment can be made promptly when materials become available. Write us regarding any locomotive requirement from six to 100 tons—Diesel, Gasoline, Electric, Diesel-Electric or Steam—wide or narrow gauge.



View of truck from above showing arrangement of motors, double-reduction gears and brake mechanism. Gears are completely enclosed in dust-proof, oil-tight, cast-steel housings.

### WORKING DATA

#### PERFORMANCE

Traction effort, starting, lbs. (30% adhesion)	39,000
Traction effort, continuous, lbs.	6,500
Speed at continuous, T.E., M.P.H.	19.5
Maximum Safe Speed, M.P.H.	26.0

#### ELECTRICAL EQUIPMENT

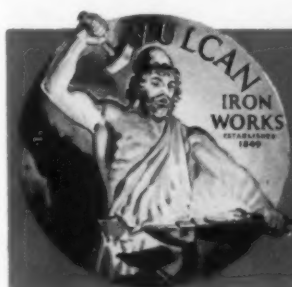
Generators, D.C.—Two, each 250 k.w., 500 volts.	
Motors, D.C.—Four, each 120 hp., 250 volts.	
Motor Gear Ratio.....	17 to 1
Control, Single Station	Electro-Magnetic

#### MECHANICAL EQUIPMENT

Engines—Two, Full Diesel, each 325 hp. at 1000-1200 R.P.M., equipped with Westinghouse Pneumatic Throttle Control.
Brakes—Westinghouse Straight and Automatic Air.
Compressors—Two, each 50 CFM, mechanically driven.

#### DIMENSIONS

Track Gauge	30" to 56½"
Truck Wheelbase	5'-0"
Length, over bumpers	35'-0"
Width, overall	8'-0"
Height, overall	11'-6"
Wheel diameter	33"



# VULCAN

NEW YORK OFFICE  
50 CHURCH STREET

IRON WORKS  
WILKES-BARRE, PA.



## WINNING COMBINATION for POSTWAR PLANTS!

In your plans for postwar expansion, don't overlook this winning combination—*Smith Tilting Mixers* for pre-mixing or pre-shrinking concrete, and *Smith-Mobile Agitators* for delivering the pre-mixed or pre-shrunk concrete to the job. Both machines are **PROFIT MAKERS** with a record of performance that has never been equaled. Their maintenance cost is almost negligible. Write today for descriptive literature.

### **The T. L. SMITH COMPANY**

2885 N. 32nd Street, Milwaukee 10, Wisconsin, U. S. A.

**Equipment  
You'll be Proud  
to Own**

#### **SMITH TILTING MIXERS**

Famous all over the world for their fast charging, thorough "end-to-center" mixing and fast tilt and pour discharge. Ideal for central mixing plants because of low maintenance costs and rugged dependability, even when worked night and day. 4 sizes—from 1 to 4 cu. yds.

#### **SMITH-MOBILE AGITATORS**

Fast loading, smooth agitating, effective mixing and **HIGH** discharge. Fast pouring or slow controlled discharge, as desired. Large radius of spout distribution. Practically trouble-proof.



# SMITH-MOBILE

**FULL POWER**  
for the  
**ACTUAL CRUSHING**

# ...KENNEDY GEARLESS CRUSHERS

**...Don't Waste Power  
in Transmitting Power**

An extremely simple and direct method transmits power in Kennedy Ball Bearing Gearless Crushers. The crusher is gearless, the synchronous motor being built right in the pulley assembly (shown in color in diagram at left). This constitutes the most modern drive for a crusher. Power is applied only for crushing; none is wasted in belts or gears. This simple, direct and positive application of power gives users of "KVS" gearless crushers more tons crushed per horsepower.

The motor runs on ball bearings and is continuously lubricated by a force feed lubrication system. The motor is built specially for this crusher duty and is the finest available. The built-in feature also eliminates the need for a separate motor foundation.

## CAPACITIES AND POWER

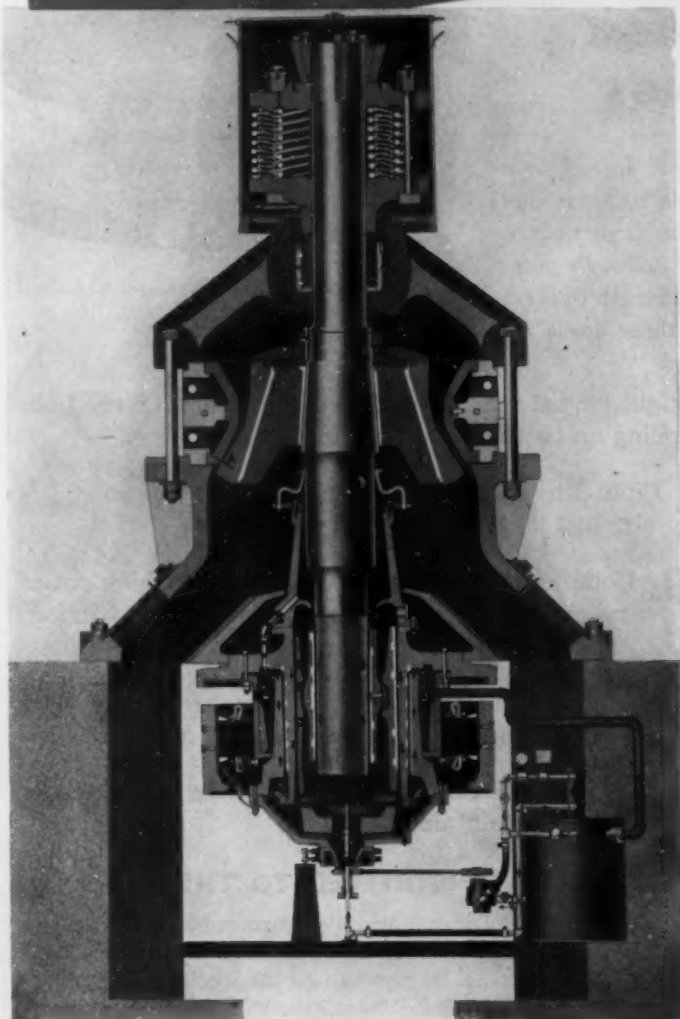
### CONSUMPTION AT DIFFERENT SETTINGS

20 Tons per hour at  $\frac{1}{4}$ " for 25 H.P.  
45 Tons per hour at  $\frac{1}{2}$ " for 40 H.P.  
120 Tons per hour at  $\frac{3}{4}$ " for 60 H.P.  
156 Tons per hour at  $\frac{7}{8}$ " for 75 H.P.

## KENNEDY VIBRATING SCREENS

Famous for high production at low cost. Kennedy Crushers are used in the largest crushing plants throughout the world. The Kennedy Crusher is truly the only crusher that gives capacity plus economy. Learn more about Kennedy Crusher performance and savings.

Write today for your copy of Bulletin 35.



ENGINEERS  
DESIGNERS  
FABRICATORS

**KENNEDY VAN SAUN  
MFG. & ENG. CORP.**

2 PARK AVE., NEW YORK, N. Y.

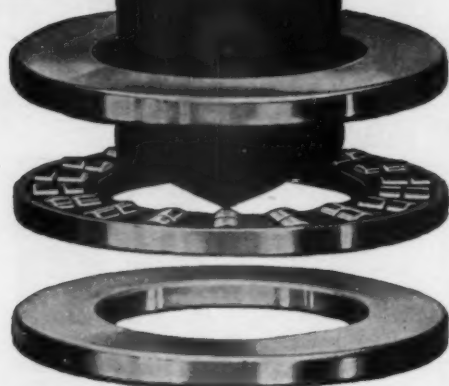
CRUSHING  
GRINDING  
CALCINING



# MORE STRENGTH TO RESIST THRUST STRESS ... Plus Lower Starting Torque

## WITH **ROLLWAY** *Right-Angle-Loaded* THRUST BEARINGS

Even relatively minor thrust stresses—if applied to a bearing carrying a radial load—are liable to cause premature failure, excessive wear on the race, or permanent deformation of the housing. That's why Rollway's pure-thrust roller bearings—with their greater strength to resist thrust stresses—are important wherever thrust loads are encountered. They give you:



1. Right-angled loading that prevents radial loads from piling up on the thrust bearing.
2. From 3 to 5 times the carrying capacity of an equal-size ball bearing.
3. Complete freedom from wedging or pinching-out of rollers, hence *less* end-rub, *less* sliding friction, and *less* roller-end wear back.
4. Long, line contact that is markedly free from brinelling under heavy oscillating or static loads.
5. Low starting torque even where an oil film is not maintained.

### ENGINEERED TO THE JOB!

Rollway bearings may resemble one another in type and series, yet each is built for a specific purpose. Be sure you get the specialized suitability you need. Send us a sketch, drawing or detailed description for free, confidential bearing analysis and recommendation. No charge or obligation.

# ROLLWAY

BEARING COMPANY, INC., SYRACUSE, NEW YORK

BUILDING HEAVY-DUTY BEARINGS SINCE 1908

# BEARINGS

WORLD'S LARGEST PRODUCER OF CYLINDRICAL ROLLER THRUST BEARINGS

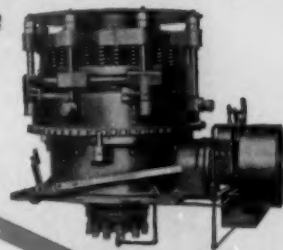
# TELSMITH GRAVEL PLANT and QUARRY Equipment



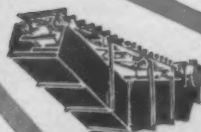
When you modernize, expand or build a new plant—Telsmith machinery is the right answer to your production problems. From crushers to bin gates, every unit is designed, engineered, and built "right" by Telsmith. And Telsmith selective engineering service fits it to do the job you want done at the lowest operating cost. To push production to new peaks—buy Telsmith. Get Bulletin E-11.



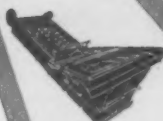
SAND TANKS



GYRASPHERE CRUSHERS



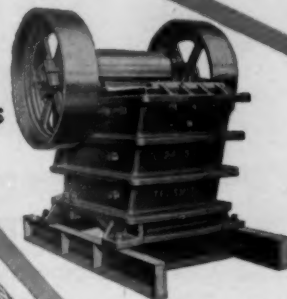
SAND DRAGS



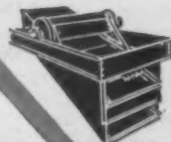
SAND CLASSIFIERS



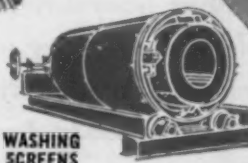
BELT AND BUCKET ELEVATORS



JAW CRUSHERS



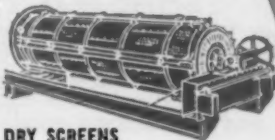
PULSATORS



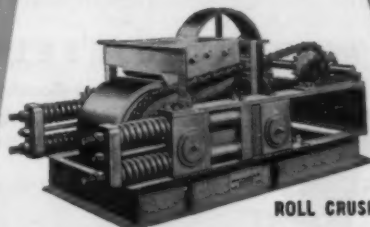
WASHING SCREENS



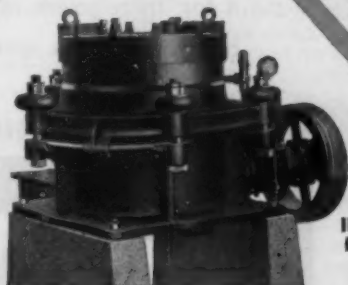
REDUCTION CRUSHERS



DRY SCREENS

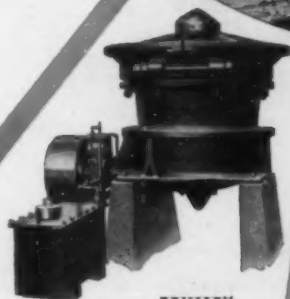


ROLL CRUSHERS



INTERCONE CRUSHERS

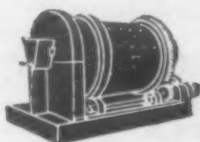
E-4



PRIMARY BREAKERS



HEAVY DUTY FEEDERS



SUPER SCRUBBERS

**SMITH ENGINEERING WORKS, 508 EAST CAPITOL DRIVE, MILWAUKEE 12, WISCONSIN**

51 East 42nd St.  
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Cable Addresses: Sengworks Milwaukee—Concrete, London  
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Cambridge 41, Mass.

G. F. Seeley & Co.  
Toronto, Ont.

Mines Eng. & Eqt. Co.  
San Francisco 4—Los Angeles 14

Brandels M. & S. Co.  
Louisville 8, Ky.

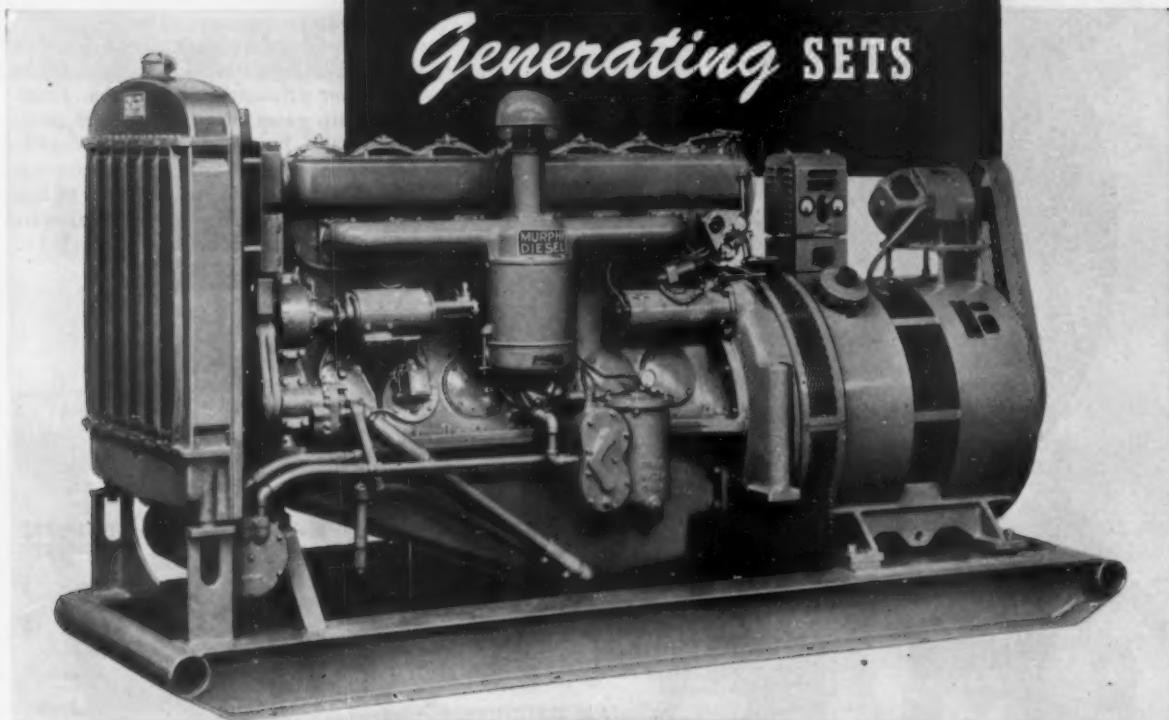
Rish Equipment Co.  
Charleston 22, & Clarksburg, W. Va.

Rish Equipment Co.  
Roanoke 7, & Richmond, Va.

North Carolina Eqt. Co.  
Raleigh and Charlotte, N.C.

Wilson-Weesner-Wilkinson Co.  
Knoxville 8, & Nashville 6, Tenn.

# MORE *Profits* WITH MURPHY DIESEL *Generating* SETS



*Portable package type Model ME-6 Murphy Diesel Generating Set, skid mounted, developing 90 Kilowatts for continuous operation.*

**R**UGGEDLY built . . . compact and relatively light in weight, but soundly engineered for heavy-duty service . . . Murphy Diesel Generator Sets are reliable power profit producers. They are easy to start, simple to operate, economical in performance-costs, low in maintenance-costs. They require minimum "time-out" for servicing . . . they are steady, dependable, long-life, trouble-free power plants . . . famous for "more power, more profit". . . and are "making good" on a wide variety of construction work, quarry work, and other equipment installations. Write for bulletin.



BUY U.S. WAR BONDS

**MURPHY DIESEL COMPANY**

5315 West Burnham Street  
Milwaukee 14, Wis., U.S.A.

*More Power*

**MURPHY  
DIESEL**  
Reg. U.S. Pat. Off.

*More Profit*

*Engines: FROM 90 to 215 HP  
Generators: FROM 60 to 115 KW*

"FIELD-PROVEN POWER"



AMERICA IS  
*Built with Aggregate!*



PLAYGROUNDS  
FOR *Champions!*

**Cedarapids**

Built by  
IOWA

**T**HIS is the home of national champions. They earned their title because of superior performance, teamwork, and the will to win.

Building a strong, safe, and permanent stadium like this requires similar qualities. The cooperation and spirit are American free enterprise which developed the equipment for producing huge quantities of low cost aggregates able to meet strict specifications. Such aggregate is produced by Cedarapids crushing equipment which has been constantly improved to provide the utmost in quality of products, low cost, and volume of production.

When you are figuring peacetime contracts for highways, airports or other engineering construction, that have made America strong, base your estimate on aggregate produced by Cedarapids equipment. Even though a large part of Iowa's production is still going to war you can always get more Cedarapids equipment for essential civilian use. Let us help you with the necessary releases and priorities. Come to Iowa, first, the home of Cedarapids aggregate producing and crushing equipment.

**IOWA MANUFACTURING COMPANY**  
**CEDAR-RAPIDS, IOWA**



### THE IOWA LINE

of Material Handling Equipment  
Includes

- ROCK AND GRAVEL CRUSHERS
- BELT CONVEYORS—STEEL BINS
- BUCKET ELEVATORS
- VIBRATOR AND REVOLVING SCREENS
- STRAIGHT LINE ROCK AND GRAVEL PLANTS
- FEEDERS—TRAPS
- PORTABLE POWER CONVEYORS
- PORTABLE STONE PLANTS
- PORTABLE GRAVEL PLANTS
- REDUCTION CRUSHERS
- BATCH TYPE ASPHALT PLANTS
- TRAVELING (ROAD MIX) PLANTS
- DRAG SCRAPER TANKS
- WASHING PLANTS
- TRACTOR-CRUSHER PLANTS
- STEEL TRUCKS AND TRAILERS
- KUBIT IMPACT BREAKERS





On which of these applications can  
**HARD-FACING**  
 make Your Equipment Last Several Times Longer?

APPLICATIONS	ROD NUMBERS		APPLICATIONS	ROD NUMBERS	
	Gas	Arc		Gas	Arc
Bowl mill liners.....	(1)	112, 101	Fuller-Kinyon pump screw flights.....	1	112, 101
Bucket heels and latches.....	(1)	112, 101	Gudgeons.....	(1)	112, 101
Bucket pins and links.....	1	112, 101	Hammers.....	(1)	112, 101
Bucket teeth and lips.....	(1)	112, 101	Jaw crusher plates.....	(1)	112, 101
Bull heads.....	(1)	112	Pins and lugs, hairpin gypsum mixer.....	(1)	112, 101
Clam shell bucket parts.....	(1)	112, 101	Plow points and skirts, coal pulverizer.....	(1)	112
Clinker spreader bars.....	(1)	112	Retainer rings, Hercules Mill.....	(1)	112
Coal crusher plates.....	(1)	112, 101	Rockwool shredder teeth.....	(1)	112, 101
Concrete mixer blades and plates.....	(1)	112, 101	Roll crusher shells.....	(1)	112, 101
Conveyor bucket dumping dogs.....	(1)	112, 101	Roll crusher teeth.....	(1)	112, 101
Conveyor bucket edges.....	(1)	112, 101	Sand washer screw flights.....	(1)	112, 101
Conveyor bucket shoes.....	(1)	112, 101	Saw teeth, gypsum mixer.....	(1)	112, 101
Conveyor pipe bends.....	(1)	112, 101	Screw conveyor flights.....	(1)	112, 101
Crusher rolls, hot clinker.....		112, 101	Segment plates, tube mill.....	(1)	112, 101
Crusher rolls, ore and limestone.....		112, 101	Shovel teeth and lips.....	(1)	112, 101
Die rings, Hercules Mill.....		112	Slag bucket teeth, cold slag.....	(1)	112
Die rings, Raymond Mill.....		112	Slag bucket teeth, hot slag.....	(10, 1)	110, 112
Dipper and dragline bucket parts.....	(1)	112, 101	Swing rolls, Bradley and Raymond Mills.....		112
Discharge spouts, Hercules Mill.....	(1)	112	Tamper feet and legs, cement block machine.....	(1)	112, 101
Disintegrator bars.....	(1)	112	Trowels for shaping concrete pipes.....	(1, 4)	112, 101, 104
Drag chain links.....	(1)	112, 101			
Fan blades.....	(1)	112, 101			
Feed chutes, tube mill.....	(1)	112, 101			
Fuller-Kinyon pump journals boxes.....	(1)	112, 101			

(1) Parentheses in the "GAS" column indicate applications where gas welding may be used, but arc welding is recommended.  
 In many cases, two pipe choices of rods are mentioned. The economical use of one or the other is a matter of experience.

Don't scrap machinery or equipment parts just because they have become badly worn. By welding a hard alloy overlay of Coast Metals to worn steel or iron surfaces, you can make your equipment good as new. In many instances, even better than new, since it will last several times longer.

Coast Metals Hard-Facing is today's maintenance answer for eliminating the need for frequent repairs or replacements, for reducing idle labor, and for keeping machinery continually on the job at peak efficiency.

Only standard welding techniques are employed in application. We shall welcome the opportunity to tell you how Coast Metals Hard-Facing can protect your equipment, too, against severe wear, impact, shock and abrasion.

**HELPFUL LITERATURE FOR YOU**

Write for any or all of these helpful technical bulletins.

**BULLETIN A:** Reference Manual Of Technical Data, Tables And Typical Industry Applications.

**FORM R-301:** Hard-Facing For Machinery Handling Cement, Crushed Stone, Sand, Gravel.

**FORM 44-1:** Price List Of Coast Metals Hard-Facing Weld Rods.

**FORM 44-2:** Instructions For Using Coast Metals Hard-Facing Weld Rods.

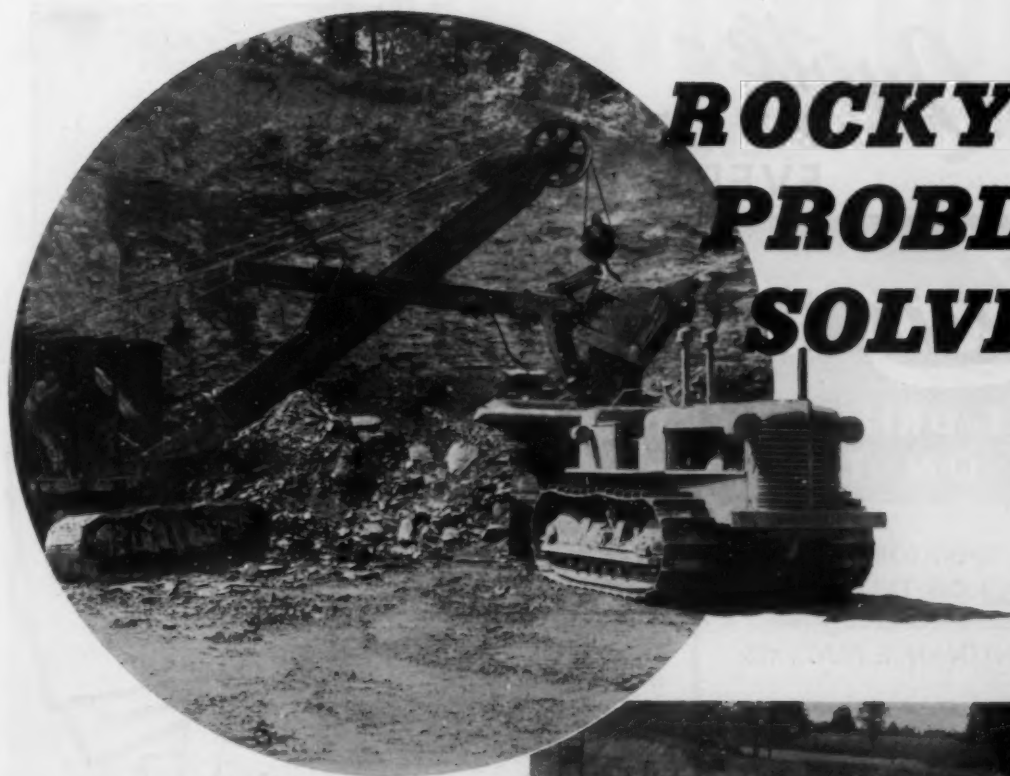
**FORM 44-3:** How To Resist Wear And Save Repair Through Coast Metals Hard-Facing.

**COAST METALS, INC.**  
 Plant and General Offices: Canton, Ohio  
 Executive Offices: New York 19, N.Y.



**COAST METALS** **HARD-FACING WELD RODS**  
 MAKE YOUR EQUIPMENT LAST LONGER

# ROCKY PROBLEM SOLVED..



**C**RAWLER TRACTORS and crawler wagons successfully solved the hauling problems of Paul Frank, North Vernon, Indiana. Several years ago he put Allis-Chalmers powerful, fast-moving 2-cycle Diesel tractors and 16-yard crawler wagons on his quarry operations... thus relieved his manpower situation. Ability of these outfits to haul bigger loads means fewer units are required, fewer operators! Also, tough crawler tracks enable him to travel over rough going at a fast pace.

Crawler tractors may be the answer to your hauling problem, too! Talk it over with your Allis-Chalmers dealer. If you qualify under government regulations, you can obtain new tractors. Fifteen per cent of our crawler tractor production is released for essential civilian use. Or you might be able to buy good used units... either from your Allis-Chalmers dealer or through him.



**ALLIS-CHALMERS**  
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

**2-CYCLE**  
*The Modern*  
**DIESEL POWER**

# We Quote -

## PIT OPERATORS EVERYWHERE...



# Thor ROCK DRILLS

## "OUT-DRILL EVERYTHING ON THE JOB"

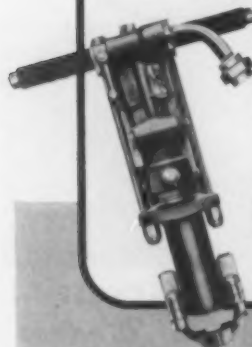
### OPERATORS ARE SOLD ON THESE THOR PERFORMANCE AND MAINTENANCE FEATURES



INT

ES

WTS



#### ● LOW AIR CONSUMPTION

Thor Positive Short-Travel Tubular Valve uses effectively every ounce of air that enters the machine . . . measures air to a tolerance of .00025 of an inch!

#### ● STEADY, FAST DRILLING

Extra-powerful rotation through extra sturdy rifle bar assembly and positive, non-slip ratchet action prevents stalling, even in heavy, sticky formations . . . full air power behind the piston gives the steel maximum forward and rotating power.

#### ● AUTOMATIC LUBRICATION

On each reciprocation of the Thor piston hammer, oil is forced under pressure through a felt filter pad to keep every part of the machine constantly lubricated.

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"Thor Rock Drill was put through rugged stripping tests and out-drilled everything on the job, showing exceptionally powerful hole-blowing capacity by holding to steady drilling despite hitting three inches of clay every three or four feet."

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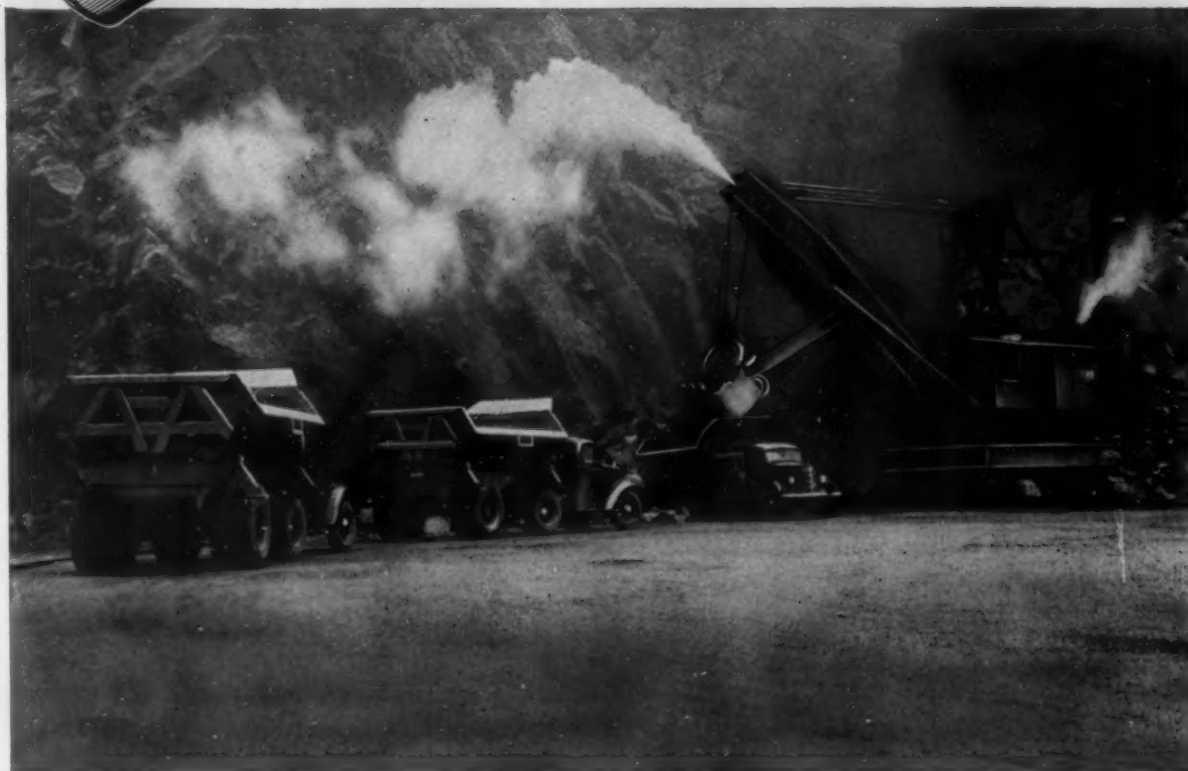
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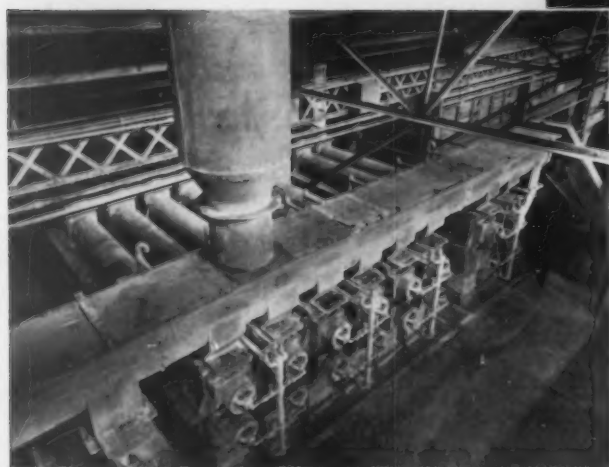
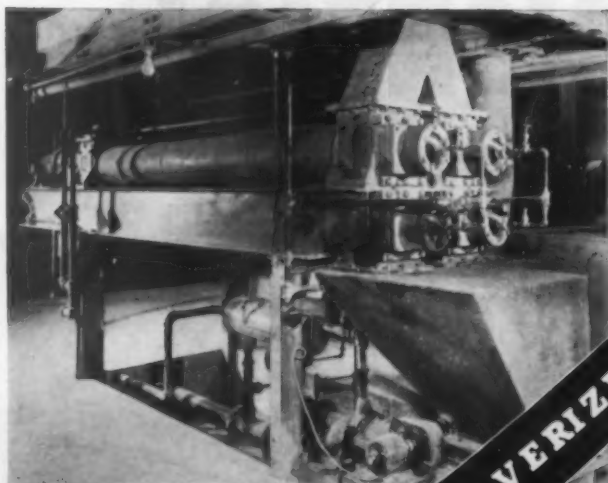
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(Write for "The Service Factor" — published periodically and devoted to the solution of lubricating problems.)

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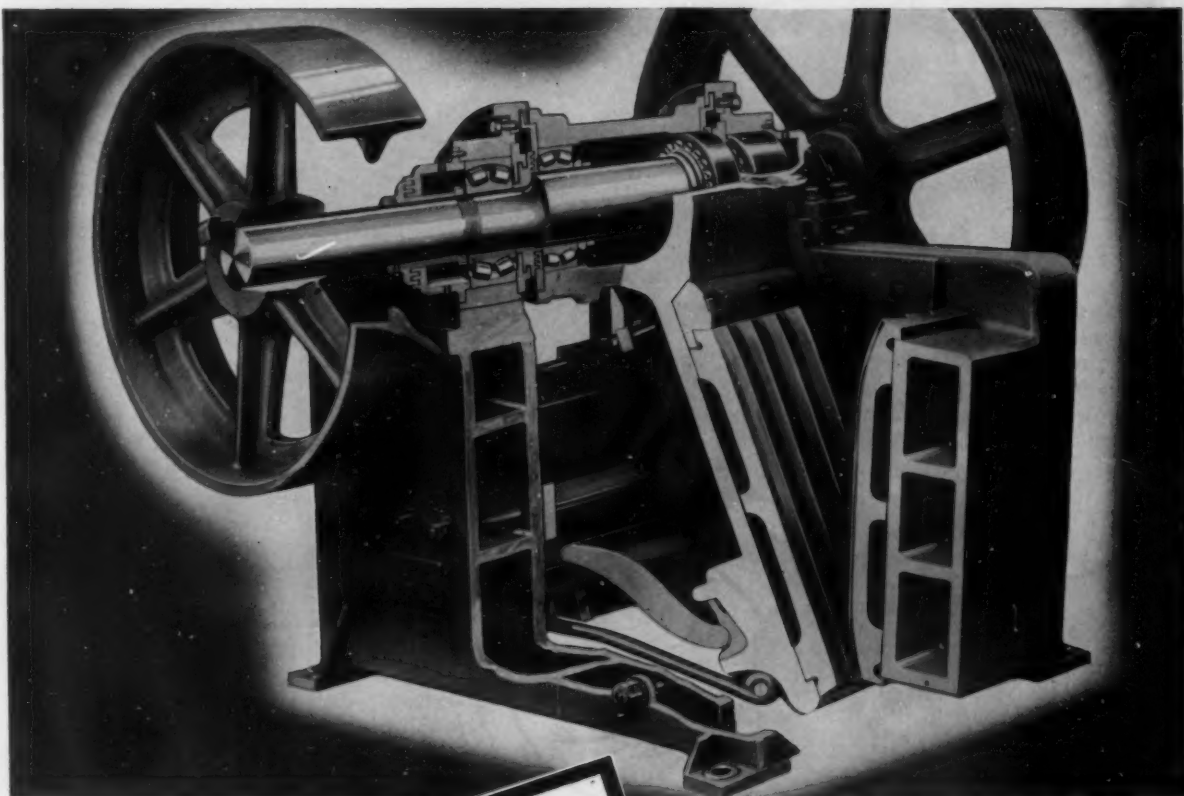
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ROCK PRODUCTS, September, 1944



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# ROCK PRODUCTS

## Wartime Practices and Future Highway Construction

**W**HILE this issue is going to press, a critical period for the Federal-Aid Highway Bill probably will have passed. Should Congress come to an early adjournment (this is a presidential election year) and fail to have made the Bill, H. R. 4915, into law, the appropriation of federal funds for post-war highway construction will have been delayed to the detriment of specific highway plans which must be expedited in anticipation of the war's end.

Maybe our fears will be proven groundless, by passage of the Law before this issue comes off the press, but if no action has been taken, intensified political pressure should be exerted on this Congress or its successor by all interested organizations and companies to get the Bill through. Why sit by and let others who delay its passage do all the political master-minding when it is to the public interest that some sort of an appropriation be passed?

The importance of post-war highway construction as a self-liquidating investment that will employ many thousands is axiomatic, but still the Bill has been kicked around and stalled for too long.

It is true that H. R. 4915 provides funds far short of the actual need of some 16 billion dollars for post-war highway construction but the \$1,500,000,000 it does set aside for matching by the States, over a three-year period, will start the ball rolling. There are too few specific plans for building roads and streets on the boards now, despite all the pressure to prepare well in advance of the war's end, and we won't know much definitely about types and designs of post-war roads until funds are actually released and in work.

When highway engineers are given the inspiration to get going, it will be of extreme interest to find out if wartime experiences in pavement construction will have any lasting significance. War Department engineers have learned the value of having adequate soil stabilization and sub-soil drainage for pavements and their experiences might influence future methods of road construction. And the fact that excessively-loaded super trucks have contributed to the breakdown of many stretches of primary roads will help focus attention on the need for building lasting roads.

We therefore anticipate that many future roads will be built over sub-ballasting amounting to thousands of tons of crushed stone, gravel, slag or other granular materials. We have heard of stretches of paved road that recently have been built over sub-base courses of aggregates exceeding 12 inches in depth. The purpose of such sub-bases is for drainage as well as support, to keep moisture from accumulating under the pavement and inhibiting deterioration, sometimes blamed on "defective" aggregates. There is every reason why highways should be drained and given support as railroads are—by ballasting—and there is plenty of evidence that funds so appropriated will prove well spent in the long run.

Designs adopted for post-war concrete pavements will at least indicate whether or not unreinforced concrete slabs built during the war have proven satisfactory. It will be recalled that emergency pavement designs developed during the war, to eliminate the use of critical reinforcing steel, were put into practice on many stretches of concrete slab. These designs had no provision for distributed steel reinforcement and some pavements were laid without any steel whatsoever. Distributed steel reinforcing mainly serves to keep cracks from opening.

### Unreinforced Pavements

The building of unreinforced concrete pavement isn't new, by any means, but it has been applied on a wider scale than hitherto and under new conditions as to locale and subsoil. We are not advocating the elimination of reinforcing steel but merely are pointing out the possibility of more widespread construction of unreinforced concrete pavements.

If experience proves that such pavements recently built will stand up satisfactorily, and we believe they are, it is reasonable to assume that more such pavements will be laid when conditions justify. Should we be correct in our prediction, producers of aggregates and portland cement stand to benefit. For, builders of unreinforced concrete pavements pay special attention to soil stabilization and sub-base support and, in many cases, have specified thicker concrete slabs than they would with distributed reinforcement.

It is said that the four-lane stretch of 9-in. concrete highway between Detroit and Ford's Willow Run plant is holding up beautifully. There isn't a pound of steel in this pavement and thousands of vehicles travel over it daily.

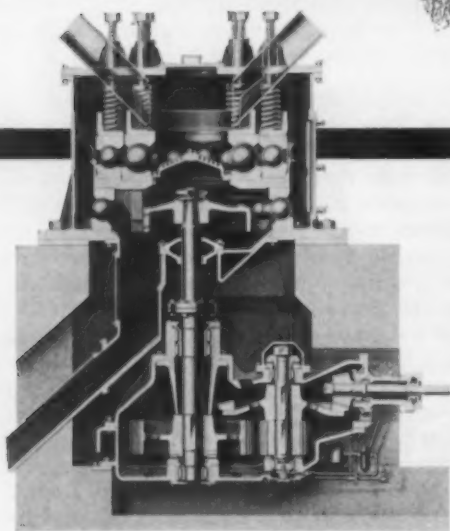
The American Iron and Steel Institute recently questionnaired State Highway Engineers with reference to the use of pavement reinforcement after the war. One of the Southern States, which built some unreinforced concrete road after W.P.B. restrictions, reported that it will continue the construction of unreinforced pavement after restrictions on reinforcing steel are lifted and that it does not expect to return to the use of distributed reinforcement. Five States reported they were still undecided whether to require reinforcing or not or that further study will be made before deciding, while a few others qualified their decisions to return to the use of distributed reinforcing by stating "for special cases only."

It will be of great interest, when post-war highway designs are in the definite working stage, to determine the comparative mileages of unreinforced versus reinforced pavements against pre-war practices.

*Bror Nordberg*

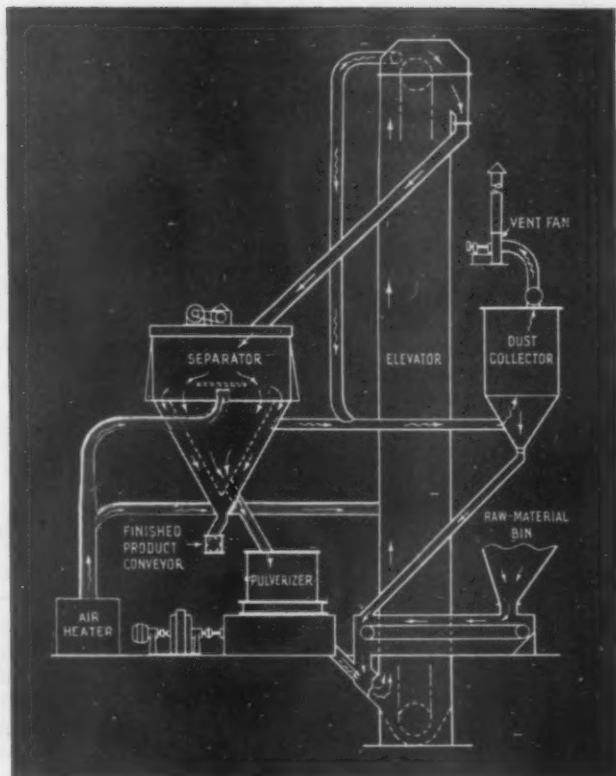


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# ★ ★ ★ Washington NEWS

**WAR** PRODUCTION BOARD's policy on special sales of idle and excess controlled materials on an excess allotment authorization has been inserted in a new amendment to rules governing such special sales. Under this policy, sales of idle and excess controlled materials under Priorities Regulation No. 13 will not be authorized on an excess allotment basis if the proposed use of materials or products would interfere with war production or labor supply needed for war production, W.P.B. officials report. However, as most sales of idle and excess controlled materials are made to persons who are directly engaged in war production for the Army, Navy, or United States Maritime Commission, or in essential civilian production, labor checks will not have to be made in such cases.

Lists in the regulation also have been modified to change the conditions under which special sales of various finished and semi-finished products and raw materials may be made. Under these changes, all construction machinery, as defined in W.P.B. Order L-192, may be sold to users without W.P.B. authorization.

## Revise Coal Distribution Control

Anticipating an acute shortage of coal during the coming winter, the Solids Fuels Administration for War has issued revised controls covering the distribution and use of all bituminous coal. The National Crushed Stone Association has distributed to its membership copies of S.F.A.W. Regulation No. 23, and has urged that members should study its provisions carefully. Section 602.512 is the regulation which applies to industrial consumers. These regulations apply to any industrial user if 10,000 tons of bituminous coal are consumed annually. You are also an industrial consumer, according to the regulations, even though you consume less than 10,000 tons of coal per year if you receive such coal in cargo or carload lots from a producer or wholesaler as defined in section 602.501.

For the purpose of determining how much coal you are permitted to receive under these regulations, it may be necessary to calculate your "days' supply" of coal and also your "monthly consumption requirements." Days supply means the total amount of bituminous coal which an industrial consumer reasonably expects he will have in storage upon the last day of the calendar month in which he places an order for coal, divided

by the average number of tons he reasonably expects will be consumed each day (including Sundays and legal holidays) during the succeeding calendar month. Monthly consumption requirements means the requirements of a plant during the calendar month in which the coal is to be received. Monthly consumption requirements should be computed separately for those sizes and qualities of bituminous coal which are not substantially interchangeable in your plant operations. Restrictions are imposed by a stock limitation table.

## Restrict Tire Quotas

War Production Board has certified to the Office of Defense Transportation a priority and preference list for use as a guide in the allocation of new replacement tires. The Office of Price Administration will handle the allocation of the large size tires to all truck and bus operators through special emergency boards which will use this list as an aid in their determination of essentiality. The critical tire shortage has developed particularly with respect to tires 8.25 size and over. The August quota for this size is 60,000 tires, less than half the average. O.P.A.'s quota for the smaller size truck tire (7.50 or smaller) also has been reduced for August to 280,000 as compared with 375,000 for July.

Sand and gravel, crushed stone and other mining and quarrying operations are listed under "Extractive Industries," and the classification is (3), both for off-the-highway and over-the-road operations.

Agricultural limestone, however, is classified in the Essentiality List under "Processing Industries, Item 31a—Navy, military, industrial and agricultural chemicals," and is given a classification of (2A).

## Revise L-192

An amendment has been made to W.P.B. Limitation Order L-192. Executive Secretary V. P. Ahearn of the National Sand and Gravel Association has given the following analysis of this amended order:

Before placing purchase orders for new equipment listed on Schedule A, producers must file application on Form WPB-1319. The application is submitted to the War Production Board Regional Office "in the region in which the purchaser desires to use such equipment."

In submitting 1319 applications for new equipment listed on Schedule A, producers must follow the instruc-

tions in the manual covering the filing of 1319 applications. Specifically producers are urged to insert "P-56" in Block 6, and the words "Mining Division—P-56" in Block 7.

Important changes have been made in Schedule A, and a careful study of the new schedule is necessary before producers submit applications on any form to any W.P.B. agency when new equipment is needed.

The only stipulation with reference to new equipment listed on Schedule B is that it shall not be sold or delivered unless the purchase order bears a preference rating of AA-5 or higher. For all new equipment listed on Schedule B, WPB-1319 applications are submitted directly to the Mining Division and are not submitted to W.P.B. Regional Offices. Producers thus proceed entirely under P-56 in securing authority to purchase new equipment of the type listed in Schedule B.

Heretofore L-192 has established restrictive procedures for the procurement of repair parts for Schedule B equipment; but paragraph (o) now provides that all such restrictions as to Schedule B equipment are removed. Therefore, P-56 procedures for repair parts are applicable to all equipment listed on Schedule B of L-192.

If the industry seeks to obtain repair parts for any piece of equipment listed on Schedule A of L-192, the following endorsement must be placed on the purchase orders in addition to other required endorsements: "Authorized under L-192—current use."

The certification required on purchase orders for repairs for current use (with respect to equipment listed on Schedule A of L-192), is inapplicable in the case of parts order over \$1,000 if such parts are to be used for crawler, walker or truck type shovels, cranes or draglines, with a rated capacity of less than 2½ cu. yd. In the case of parts orders exceeding \$1,000 for current use for such machines, a WPB-1319 application, in quadruplicate, must be forwarded to the Construction Machinery Division, War Production Board, Washington, D. C.

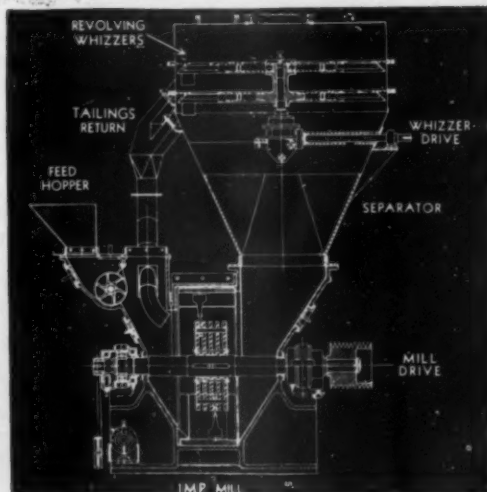
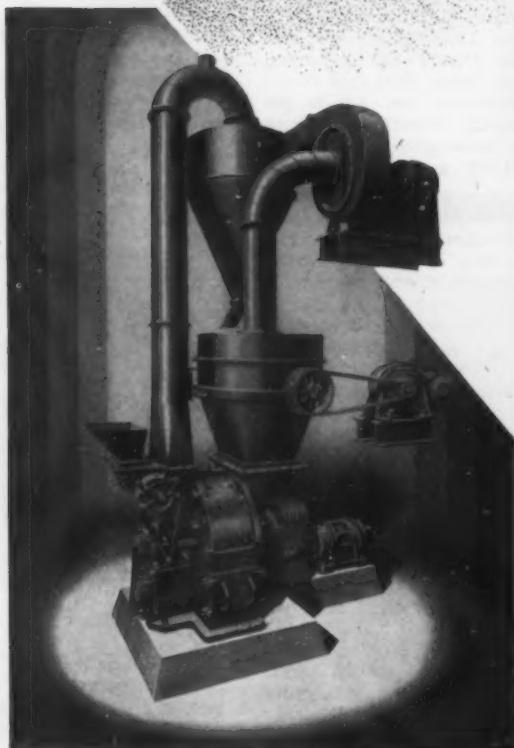
## O.P.A. Permits Adding Wage Increase

After August 26, 1944, the construction industry may add to presently established ceilings for construction services, increases in wage costs since October 3, 1942, that have been approved or authorized by the

(Continued on page 39)

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# Rocky's NOTES

## Post-War Employment Plans

AS ONE OF THE 35,750 unsuccessful contestants for the Pabst Post-war Employment Awards—essays for solving the post-war unemployment (or employment) problem—the writer has received a publication containing the 17 prize-winning essays. Copies of the publication have also been sent to members of Congress, prominent government officials, and very likely to the business and popular press, although to date we have seen little or no mention of it. Nine of the prizes, including the first and second (\$25,000 and \$10,000, respectively) went to young economists in the New Deal administration, so that if one may judge by the weight of evidence, there is reason to believe the plans submitted will become more or less in effect if the present administration holds over into the post-war period. For that reason, if no other, these plans are of interest.

All the suggested methods for post-war employment give lip service to the part that must be played by private industry, private enterprise or private capitalism, all meaning the same thing. However, all the plans do recognize that one the first steps that must be taken is tax reform, particularly in corporation taxes, so that there will be some incentive to risk capital in new products and new ventures. The loss of government revenue as a result of reduction and changes in corporation taxes would be made good by stiffer individual income taxes on the middle bracket incomes. The income taxes in the highest brackets would be eased, on the theory that it is from this source that new capital for industry comes.

The middle bracket income people are made the target on the assumption that they don't have to spend all their incomes for necessities and therefore put some into savings; and saving by the common people is to be discouraged at all costs, because only by spending all their income can the people of the United States achieve its prosperity.

The main theme in practically all the government economists' plans is *spend, spend and spend* some more our way to prosperity. If the people are not able to win their own spend-

ing money, let the federal government step into the picture in a variety of ways to supply them with spending money—broaden social security, unemployment insurance, soldier bonuses, direct government purchases to sustain market prices, etc., etc.

Another line of argument, which arises persistently in these prize-winning plans, is that with our tremendous capacity to produce—beyond our domestic possibilities of consumption—we should expand our foreign trade even if it means *long-term* credits, and importation of foreign goods, even if the government has to stockpile them against the next war. This last argument has its merits because we shall have almost exhausted some of our continental natural resources—such for example as the cheap, rich Minnesota iron ore—before this war is over. However, in view of our obligation to posterity, it is difficult to see justification for a continuation of top-velocity exploitation of our diminishing resources, just to give people something to do.

It is time that people realized that this earth, and this broad land called the United States, is not the exclusive property of this generation. We are merely life tenants, and have no right whatsoever, morally, to exploit its natural resources beyond our own immediate needs.

Construction has a place in nearly all these prize-winning plans, but it is recognized in all cases that construction work is not the whole answer. Particular emphasis is put on government housing, and government inspired private housing, as a means of providing employment.

To us, the most sensible and practicable prize-winning plan is that of the only successful woman contestant, an economist associated with the National Bureau of Economic Research, New York. Her plan would make personal income taxes on a pay-as-you-go basis the main source of federal revenue, with corporation

profit taxes reduced to the point where they would serve "merely to induce salutary standards of business procedure." There would be a high tax on unspent receipts from operations—receipts minus expenditures, where receipts are more than expenditures. However, included in expenditures would be cash dividends to stockholders, purchases of new plant or equipment and the value of the increase in inventories (excluding markups) not deemed to be excessive.

The object, of course, in this plan is to compel corporation profits to be used, either paid out to stockholders for their use or put into plant, equipment or inventory, but to discourage speculative increase in inventories. We don't see how the plan could prevent speculative investment of corporation income in new plant and equipment; but probably this is or should be a matter within the control of the stockholders of each individual corporation. This lady's plan also suggests a possible tax on the unspent income of individuals, which might be reasonable if "spending" one's income includes investment in stocks, bonds, life insurance and savings banks' deposits, which are among the chief sources of industry capital.

One prize-winner is a major in the U. S. Army in Italy. From his talks with American soldiers abroad he has learned of their ambitions and suggested a plan for providing capital for many independent business enterprises, which he has found out that a great many of these soldiers want to start in the post-war years. The major would have the federal government through a "Business Finance Corporation" provide capital for these enterprises in 5 or 10 thousand dollar chunks. One of the other prize winners has a better plan for financing local business—a kind of local trust company which would spread its investment funds throughout various local industrial enterprises, thus insuring enough diversity for some degree of security to the trust, or investment, company funds, and, incidentally, although not mentioned, providing a maximum of local ownership and local loyalty.

The only conclusion we can draw from these prize-winning essays is that the country will have a far-better chance of solving its difficulties if the plans of other than present government economists are followed. If those in this publication are samples of projected federal government planning, in spite of the fact that they have here won \$40,000 of the \$50,000 prize money, they seem to be too cocksure with formulas for bright young men like the authors to experiment with on a long-suffering nation.

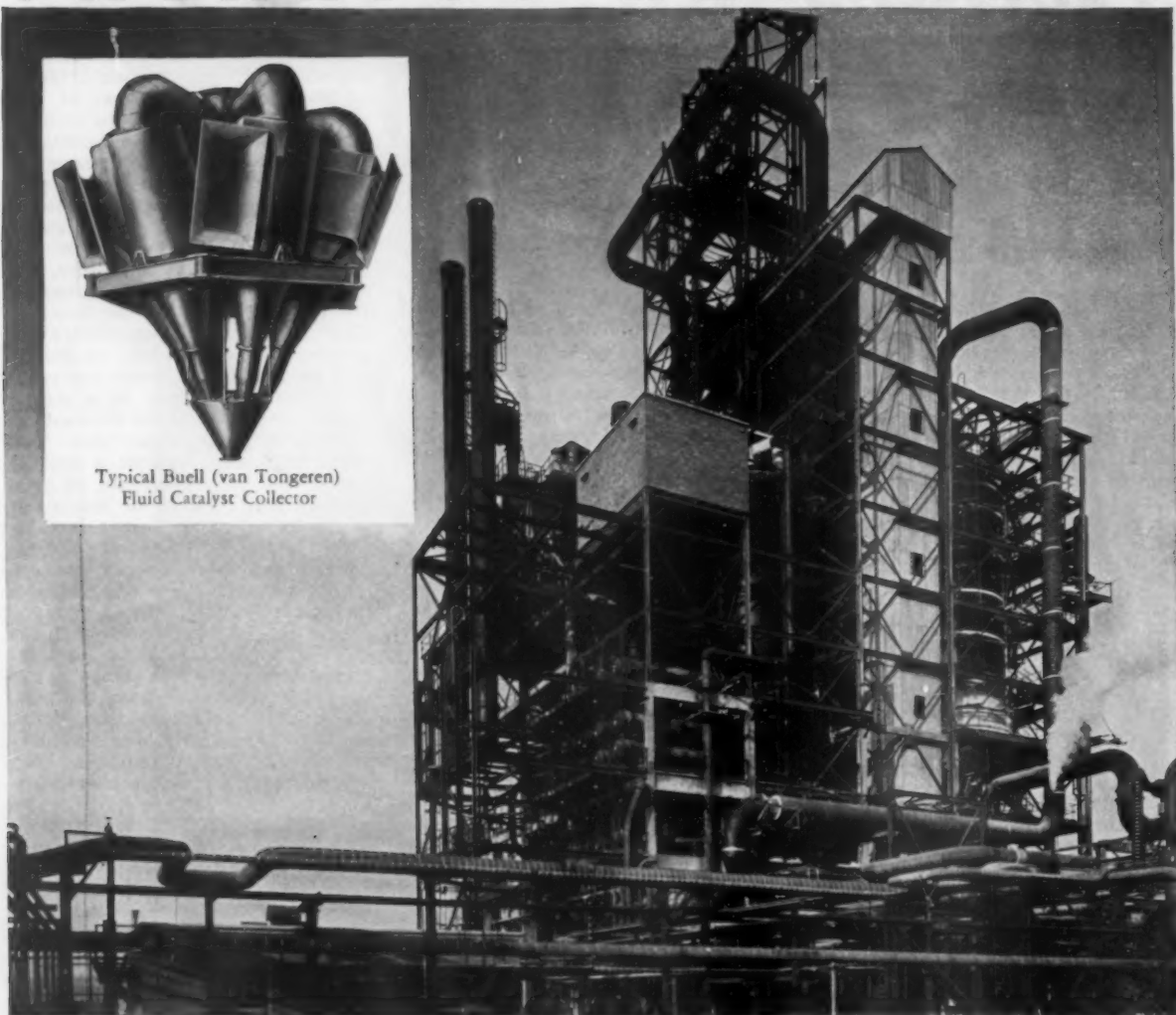
Nathan C. Rockwood



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Typical Buell (van Tongeren)  
Fluid Catalyst Collector



Fluid catalyst cracking plant for 100-octane gasoline in one of America's large oil refineries.

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An important part of the process is the Buell (van Tongeren) Catalyst Collector. Both the plant and the collector are representative of the type which have been installed by a number of oil companies making possible the production of tremendous quantities of gasoline required by the war program. Catalytic cracking is but one of the developments

which point up the ingenuity and scientific progress of the American oil industry and by which high production of 100-octane gas has been possible.

Further, here is the strongest of indications of Buell's high efficiency and wide application. In designing and building over two-thirds of the nation's fluid cat-cracking capacity . . . The M. W. Kellogg Company has installed Buell catalyst recovery systems throughout.

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# News

## ABOUT THE INDUSTRY AND PEOPLE

### Heads Phosphate Operations

ARTHUR CRAGO has been appointed manager of the phosphate rock production operations of the American Cyanamid Co., New York, N. Y., with headquarters at Brewster, Fla. Mr. Crago's previous positions were manager of the Phosphate Recovery Corp., Mulberry, Fla., manager of the Phosphate Mining Co., Nichols, Fla., and assistant superintendent of U. S. Phosphoric Products Division of Tennessee Corp., Tampa, Fla. He is a member of the Mining and Metallurgical Society of America and of the American Institute of Mining and Metallurgical Engineers.

### Becomes Plant Manager

FRANK GARDNER, for 20 years assistant to William Fowden, plant manager of the South Dakota Cement Plant, Rapid City, S. Dak., has been appointed plant production manager and purchasing agent, and Mr. Fowden has been appointed consulting engineer. Mr. Fowden came to the state-owned plant in 1924 to take charge of the manufacturing division of the plant's operation. He has been engaged in the cement manufacturing business since 1906.

### Limestone Superintendent

BERNARD MANDERFIELD has been appointed superintendent of the underground limestone mining department of the Columbia chemical division of the Pittsburgh Plate Glass Co., Barberton, Ohio. He resigned from the Copper Range Co., where he was general superintendent.

### Industrial Consultant

SAMUEL M. SHALLCROSS, director of development and research, Warner Co., Philadelphia, Penn., has announced the opening of an office in the Real Estate Trust Bldg., Philadelphia 7, Penn., as industrial consultant.

### Receives Commission

ENSIGN WILLARD KISSEL, formerly employed in the engineering department of Warner Co., Bellefonte, Penn., has received his commission at Cornell University where he will remain for further training.

### Burned at Plant

CHARLES V. HARRIS, superintendent of the Peace Valley phosphate flotation plant of the International Minerals and Chemical Corp. at Mulberry, Fla., was severely burned on the legs and right side of his body

when working at the plant last March. Since then he has been in the hospital at Lakeland, Fla., but following extensive skin grafting he expects to be out in the early fall.

### Mining Engineer

H. LORENZ WALDTHAUSEN, Jr., formerly plant engineer for the Calaveras Cement Co., San Andreas, Calif., is now a mining engineer in the iron and steel division of the Kaiser Company, Oakland, Calif.

### Huron Appointments

C. L. LAUDE, formerly purchasing agent of The Huron Portland Cement Co., Detroit, Mich., has been appointed general sales manager of the company, and P. L. BIASSELL has been named purchasing agent.

### New President

RAWSON G. LIZARS has been elected president of Certain-teed Products Corp., Chicago, Ill., to succeed Hector J. Dowd.

### Named Research Director

WALTER L. MAXSON, manager and chief engineer of the mining division of Allis-Chalmers Mfg. Co., Milwaukee, Wis., has been named director of research for the Oliver Iron Mining Co., a subsidiary of the U. S. Steel Corp. Mr. Maxson, a nationally known metallurgist, was educated for the mining profession with degrees from Cornell and Colorado School of Mines. He began his career with the Anaconda Copper Mining Co. in 1915 as testing engineer and metallurgical chemist. In the follow-

ing five years he had experience in mining, mineral dressing, hydro- and pyro-processing of both metallic and non-metallic ores and minerals with many well-known companies. He then served six years as associate professor of metallurgy at Colorado School of Mines before he joined Allis-Chalmers in 1927 as engineer in the mining department, later advancing to chief engineer, more recently assuming the post of manager, mining division, including supervision of engineering and research. With Allis-Chalmers, he inaugurated a program of mineral research which has continued under his supervision. This work included fundamental research in crushing, grinding, and treatment of raw materials and by-products.

Mr. Maxson has maintained close contact with ferrous and non-ferrous industries throughout the world and has actively participated in recent milling developments in ore fields of the Eastern States as well as Alabama and Texas. He has been responsible for new techniques used for grinding, concentrating, washing and pyro-processing.

### Asphalt Institute Engineer

W. A. BUGGE, formerly city engineer of Port Townsend, Wash., has been appointed district engineer of The Asphalt Institute for the territory comprising northern California, Oregon, and western Washington, with offices at 301 Wilcox Bldg., Portland, Ore., and 1304 Fourth Ave., Seattle, Wash.

### Zoning Chairman

ARTHUR C. HEWITT, chief engineer, Warner Co., Bellefonte, Penn., has been appointed chairman of the newly formed Bellefonte Borough Zoning Commission. Mr. Hewitt was chairman of a group of five citizens which prepared the zoning ordinance.

### Development Manager

PAUL L. BOCK has been appointed manager of development at the Cedar Hollow plant of Warner Co., Philadelphia, Penn., and will work directly under Irving Warner, vice-president in charge of engineering and purchasing, and in conjunction with J. A. Murray, director of research.

### Chemical Co. Manager

WALTER P. KONRAD has been appointed branch manager of the phosphate division sales department of Monsanto Chemical Co. in Chicago, Ill.



Walter L. Maxson

## Cement Official Honored

C. BAUMBERGER, Sr., president of the San Antonio Portland Cement Co., San Antonio, Texas, has been honored by the City of San Antonio through the establishment of "Baumberger Plaza" in Brackenridge Park. This is the site of the first portland cement plant west of the Mississippi river and the second portland cement plant in the United States. Founded in 1880, it continued operations until 1907, when suitable raw materials were no longer available. A year later, in 1908, the San Antonio Portland Cement Company was founded, with Mr. Baumberger as president, which position he has held continuously to date. The present location of this plant is at Cementville, Texas, about five miles north of San Antonio.

## Transferred

HUBERT O. DeBECK, field engineer and district manager of Colonial Mica Corp. at Custer, S. D., is now in the company's New York offices where he will be technical assistant to the president.

## Named Secretary-Treasurer

E. R. DUFFEE has been appointed secretary-treasurer of the Monolith Portland Cement Co. and the Monolith Portland Midwest Co., Los Angeles, Calif., to replace J. J. Calkins, deceased. Mr. Duffee has been with the companies since 1921 and previous to his new appointment was as-

sistant secretary-treasurer. P. A. CARMICAL, formerly auditor, has been named assistant secretary-treasurer.

## President of Fluorspar Co.

SAM SCLAVERNITIS of Denver, Colo., has been elected president of the Chaffee County Fluorspar Corp., Salida, Colo.

## Research Specialist

C. A. G. WEYMOUTH, well-known concrete engineer, and author of the article in *Rock Products*, February 25, 1933, p. 26, "Effects of Particle Interference in Mortars and Concretes," is now research specialist for Consolidated Rock Products Co., Los Angeles, Calif. The company has built and is now equipping a special laboratory for studies of aggregates, concrete and special sand, gravel and rock products.

## OBITUARIES

D. G. MORRISON, who for 35 years had been in active charge of the large area of phosphate reserves owned by Hoover & Mason Phosphate Co., in Maury and Hickman Counties, Tenn., died August 4. He was 78 years old. Mr. Morrison was born in Ireland and came to this country about 55 years ago, first entering the service of Armour Fertilizer Works, Chicago, Ill. His son, Ronald Morrison, is manager of the Mt. Pleasant, Tenn., office of Hoover & Mason Phosphate Co.

EDGAR H. BRISTOL, president of The Foxboro Co., Foxboro, Mass., and one of its founders, died July 24 at his summer home at Falmouth Heights, Mass. He was 73 years old. Mr. Bristol had unusual mechanical skill, and after completing his high school education he found employment as a machinist, later becoming a tool-maker and subsequently production manager of the instrument company of which his father was president. With his brother, Bennet B. Bristol, he withdrew in 1908 to organize the Industrial Instrument Co. which, in 1914, became The Foxboro Co. More than 40 patents were recorded to his credit, some of them so basic in character as to establish new principles of instrument design and operation. The helical spring, which is the measuring element in temperature and pressure recorders, is an example of his inventive genius.

MILTON GRANT ERWIN, who for many years operated a lime plant at Mitchell, Ind., died recently at the age of 81. Mr. Erwin's father opened the stone quarry a number of years ago and became one of the first commercial manufacturers of lime in that part of the State. It was developed into a large business and Mr. Erwin joined his father in operating the plant. After his father's death he carried on the business for a number of years. Mr. Erwin's wife and only daughter died a number of years ago.

EDGAR M. TAPP, retired quarryman who was well-known in central and southern Indiana, passed away recently at his home in Bedford, Ind. He was 75 years old. He is survived by his widow, two sons, one daughter and a brother.

CARL SWENSON, manager of the Putnam Sand and Building Co., Salina, Kans., died recently at the age of 53.

WALTER S. MILLER, head of the Miller Sand Company, Falls Creek, Penn., passed away August 21. He was 64 years of age.

JAMES HENRY BROWN, who had been engaged in the sand and stone business in Asheville, N. C., for a number of years, died suddenly August 17 of a heart attack. He was 72 years old.

CHARLES H. KAMMANN, president, Ste. Genevieve Lime Co., St. Louis, Mo., died July 23 at his home in Belleville, Ill.

FRED TODD, chairman of the board of directors of The Bessemer Limestone & Cement Co., Youngstown, Ohio, died July 29.

(Continued on page 108)



Harry H. Brainard, executive manager of Western Pennsylvania Safety Council, congratulating A. J. Hippert, general superintendent, Keystone Sand and Gravel division, Dravo Corporation, Pittsburgh, Penn., for winning first place in the safety contest sponsored by the Bureau of Mines and the National Sand and Gravel Association. Trophies are awarded by ROCK PRODUCTS. Others in the picture are Gerard Griffin, safety director of the Dravo Corporation, and L. C. Laymon, captain of Keystone's Dredge No. 9.



## Start Up Quarry

E. C. JOHNSON, operator of several quarries near Carrollton, Mo., has leased part of the Jim Thornburg farm, 1¼ miles from the Terrill School, and will open a quarry. It is said that most of the machinery has been installed, and production probably is under way by this time. Mr. Johnson has a contract with the Missouri State Highway Department for crushed rock, but he also plans to make agricultural limestone and sell crushed stone locally. The capacity is about 500 tons a day.

## Making New Products

C. W. KOEHLER CONCRETE BLOCK Co., Upper Sandusky, Ohio, has been very active in the promotion of concrete for all purposes. Mr. Koehler purchased the business in April, 1943, and now has an efficient plant turning out concrete block, concrete burial vaults, and ready mixed concrete. He operates two transit mixer trucks. The burial vault business is a recent addition under the direction of W. C. Bickham.

## Building Phosphate Plant

J. R. SIMPLOT, said to be operator of the world's largest dehydrator, is constructing a new superphosphate plant at Pocatello, Idaho. Plans call for production to start about November 15, 1944. Initial plant capacity will be about 80,000 tons per year. Officers of the company are J. R. Simplot, president and E. R. Prevot, general manager.

## Fluorspar Mill Fire

KRAMER MINES, INC., located 11 miles northwest of Salida, Colo., was completely destroyed by fire with total damage estimated at nearly \$100,000. The fire at the fluorspar mill was believed to have been started by lightning. Fire insurance covered the loss, and it has been announced by Mr. Kramer that the plant will be rebuilt immediately.

## Add Phosphate Mill

VIRGINIA-CAROLINA CHEMICAL Co., mining branch, has increased production of ground phosphate rock for the two distributors served by this company; namely, Robin Jones Phosphate Co., and Midwest Phosphate Co. Manpower shortages have reduced milling capacity to a considerable degree in the Tennessee field.

## Open Quarry

ROCHE HARBOR LIME AND CEMENT Co., Roche Harbor, Wash., is reported to be opening a new quarry on Texada Island, British Columbia. The new quarry is to be opened to supplement present sources of raw material for the manufacture of lime.

## COMING CONVENTIONS

**American Institute of Mining and Metallurgical Engineers, Annual Meeting, Pennsylvania Hotel, New York, N. Y., February 18-22, 1945.**

**Industrial Minerals Division, American Institute of Mining and Metallurgical Engineers, Meeting, Statler Hotel, Boston, Mass., September 27-29, 1944.**

**National Chemical Exposition and National Industrial Chemical Conference, Chicago Coliseum, Chicago, Ill., November 15-19, 1944.**

**National Ready Mixed Concrete Association, Annual Meeting, Hotel New Yorker, New York, N. Y., January 24-26, 1945.**

**National Sand and Gravel Association, Annual Meeting, Hotel New Yorker, New York, N. Y., January 23-25, 1945.**

## New Construction

TOTAL new construction put in place in the United States during July amounted to \$320,000,000, a decline of 53 percent from July, 1943, according to preliminary figures released today by the War Production Board. Of this amount, \$193,000,000 fell in the category of publicly-financed construction and \$127,000,000 for private account. In comparison with July a year ago, publicly-financed construction fell 64 percent while the decline in privately-financed construction was 11 percent.

Private new construction rose slightly during July, 1944, showing a four percent gain over June, 1944, but a five percent decline in publicly-financed activity caused total construction in July this year to drop almost two percent.

The increase in private construction was due to seasonal factors, while the decrease in public construction was attributed to a falling off of military and war plant construction. It is expected that total construction will level off slightly during the summer and show a decrease in the final quarter of 1944.

During July, construction of mili-

tary establishments (camps, military hospitals, airfields, storage bases, etc.) dropped only two percent. Government-financed plant expansion (construction of plants and the delivery of machinery and equipment to plants) fell off 12 percent. Construction activity alone decreased 16 percent. Deliveries of machinery and equipment dropped 10 percent.

Housing construction as a whole was just two percent under the June level. Privately-financed housing construction showed a mild increase, but publicly-financed housing activity continued its decline. All other types of construction (community buildings, sewer and water, farm, utilities, etc.) showed seasonal increase.

For the year 1944 as a whole, total construction activity is expected to be approximately \$3,550,000,000, or 54 percent less than in 1943. The sharpest decline is expected to occur in the field of public construction activity with a drop of 65 percent from 1943, while private construction for the year is expected to drop about 10 percent.

## Washington News

(Continued from page 33)

Wage Adjustment Board, National War Labor Board, or Economic Stabilization Director. It is the opinion of O.P.A. that although industrial and commercial building has declined from war peaks, the remaining volume, approximated at \$7,500,000,000 for 1944, makes it imperative that price control for the industry be continued. Almost half of the estimated volume of business for the industry for 1944 concerns repair and maintenance work.

In computing ceiling prices under the revised regulation, the new approved wage rate may not be substituted for the old rate, since the percentage margin factor of the pricing formulas would cause unwarranted price increases. The difference in labor cost between the old rate and the new adjusted rate is added to the maximum price. Coverage of the regulation remains the same except that contracts with the War and Navy Departments and certain types of contracts of the Defense Plant Corporation, formerly exempt, are now under regulation. Other changes include: (1) removal of the requirement that a certification of compliance with the regulation must be given on all sales over \$500 (a certificate is now required only where demand is made by the buyer), and (2) the delegation of authority to Regional Administrators to issue pricing orders for particular kinds, types or classifications of construction sales and service in communities where there is need for such action. This order is a revision of M.P.R. No. 251.

## Heavy Navy Construction

NEW CONSTRUCTION totaling about \$500,000,000 has been planned within the continental United States by the Bureau of Yards and Docks during the fiscal year 1945, states Vice-Admiral Ben Moreell in a recent issue of *The Constructor*, official publication of the Associated General Contractors of America. Most of this amount will be spent on competitive bid lump sum contracts for a wide variety of shore facilities necessary to the operation of the Navy's tremendously augmented fleet.

"Approximately one-third of next year's budget for continental construction," he explains, "will be devoted to increasing air training facilities and new air bases. These facilities, earmarked at nearly \$170,000,000, will be designed to handle an additional 3,750 planes.

"The next most extensive undertaking, reflecting the increased demands for naval ordnance brought on by the expansion of the fleet and its far-flung offensive operations, will be the construction of ordnance facilities at a cost of approximately \$95,000,000. For fleet facilities themselves, an additional \$33,000,000 of construction is scheduled for operational group training facilities, for amphibious training, for fleet and cargo piers, dredging, convoy and escort bases, emergency mooring equipment and navigation aids and other facilities.

"Another sizable undertaking will be storage facilities. Approximately \$70,000,000 is set out in next year's budget for storage tanks, dumps and warehouses needed in channeling the flow of fuel and supplies to the fleet and its air arm."

Construction of new hospitals and extension of existing institutions to provide for 14,370 additional beds for wounded veterans, is provided for by a \$33,000,000 item in the 1945 budget, Admiral Moreell states. At the same time this work is undertaken, an additional \$22,000,000 will be spent for construction of Navy personnel housing and training facilities for men to go out to the combat zones, together with \$20,000,000 for housing and training of Marine Corps personnel.

"Not only will the bureau undertake this new construction," he continues, "but it is faced with the tremendous job of maintaining well over \$5,000,000,000 worth of shore establishments built in this country for the Navy since the beginning of the emergency in July, 1940. This represents a 12-fold increase over the size of our shore establishment at the start of the emergency program. It explains graphically what we mean when we say that the Navy

has expanded its shore stations to keep pace with the needs of the expanding fleet."

## More Private Construction

PRIVATE construction is playing a relatively more important part in building activity than it did a year ago. This fact was revealed recently in a report by F. W. Dodge Corporation on construction contracts awarded in July in the 37 states east of the Rocky Mountains.

The trend is most remarkable in residential construction where the relative positions of public and private construction has been reversed in a year, but it is being demonstrated in nonresidential construction as well.

In the residential field, public construction during the first seven months of last year represented 61 percent of the total as compared with 35 percent so far this year.

Public construction represented 92 percent at this time last year as compared with 76 percent today in non-residential building. In this category are included commercial, manufacturing and educational buildings, hospitals, public and religious buildings, social and recreational buildings, as well as miscellaneous non-residential buildings.

Although the total July construction volume of \$190,539,000 exceeded by \$6,878,000 the volume reported during the corresponding month of last year, the seven-month total for 1944 lags considerably behind the total for the January-July period of 1943. The comparative figures for the seven-month periods were \$1,150,760,000 and \$2,034,933,000, the Dodge company's reports show.

## Producers' Council Outlines Post-War Housing

PRODUCERS' COUNCIL, a national organization of manufacturers of building materials and equipment, has outlined a post-war housing program. Five principal suggestions in the program deal with (1) needed revisions in the structure and functions of Federal agencies which deal with housing, (2) improved facilities for financing home construction and residential repairs, (3) feasible methods of providing housing for needy families, (4) means of protecting the purchasers of dwellings, and (5) proposals for the sound future development of cities. To assure adequate financing for post-war housing, the program recommends that the F.H.A. be strengthened and continued until suitable facilities for encouraging low interest rates and permitting low down payments on homes are provided by private enterprise, without need for governmental insurance of mortgages.

## Roofing Granules Decline

REFLECTING the drop in building construction, the Bureau of Mines reports that output of roofing granules in 1943 was about six percent lower than in 1942. In the Eastern area, where natural granule output is concentrated, roofing production was lower than in 1942 and consequently natural granules declined 19 percent in tonnage. On the other hand, artificially colored and brick granules, produced mainly in the Midwest, increased one and 10 percent, respectively. In 1943, production of natural granules totaled 287,090 tons, valued at \$2,190,143, as compared with 352,320 tons in 1942 valued at \$2,650,503. The production of artificially colored granules in 1943 totaled 543,870 tons valued at \$7,745,452 which compares with 538,310 tons in 1942 valued at \$7,594,174. Brick granules amounting to 47,650 tons in 1943 and valued at \$716,685 compared with 43,230 tons in 1942 valued at \$636,961.

## Gypsum Five-Point Program

GYPSUM ASSOCIATION, Chicago, Ill., has advanced a five-point program of education and preparation for peacetime building activity, according to a statement released by Henry Schweim, general manager of the association. The program follows:

1. Debunk the "dream house" publicity. Make it clear to everyone that houses with everything from the vacuum cleaner to the dishes built-in are not going to come the day the war is over.

2. Impress local officials with the importance of allowing proved new materials and new methods of construction, both of which may make possible better buildings, otherwise postwar homes may be outdated and the building revival checked by shortages of older materials.

3. Emphasize the importance of safety features, fire protection and durability in homes. The desirability of a home will increase with its substantiality and safety.

4. Promote remodeling and modernization of homes and apartment buildings. Although wonder houses will not be possible, older buildings will have to put on new clothes to compare favorably with the new ones that will go up in quality.

5. Educate farmers to the best methods of construction and the importance of fire protection.

## Bentonite Increase

BENTONITE showed a substantial increase in production in 1943, sales totaling 480,202 tons valued at \$2,997,754, an increase of 28 percent in tonnage and 18 percent in value over 1942, according to a recent Bureau of Mines report.

## Develop Concrete of Unusual Strength

RESEARCH studies at the Northwestern University, Technological Institute, have resulted in the development of a light-weight concrete of great strength which has been designed as a substitute for steel. Prof. George A. Maney, chairman of the Department of Civil Engineering, who has headed this work, reports that concrete columns can be produced at about one-third the cost of steel. Maurice Legaard, assistant professor, conducted the tests and designed a proposed plant for mass production.

The unit, designed for buildings, bridges, and special foundations, is composed of highly compressed concrete with spiral steel reinforcement. Exceptional strength was obtained by compressing the concrete and reducing the amount of water in the mix. Only one gallon of water per sack of cement was used. A special method of vibrating concrete is used. Columns of this reinforced concrete have been tested to 1,000,000 p.s.i. compression.

## Reopening Lime Plant

ENTERPRISE LIME Co., Enterprise, Ore., has resumed operation after a shut-down of many years. The plant has not been in operation since 1937. Kilns are now being reconditioned and rebuilt. This property was recently purchased by R. S. Painter, Portland, Ore., who announced that government funds were secured to assist in reconditioning the plant. V. Z. McCrary, who was associated with the plant when it was first placed in operation and who recently was with the Washington Brick & Lime Co., at Williams, Ore., will take over management of the plant.

Capacity will be about 80 tons of rock and 40 tons of lime per day. A large deposit of black marble is located only about three miles from the plant, and this rock has been found to produce a high grade of lime. Ten-ton capacity trucks will haul the rock to the plant.

## Purchases Railroad

E. J. KRAUSE, president of the Columbia Quarry Co., St. Louis, Mo., has become financially interested in a branch line railroad. The Columbia & Millstadt Railroad Co., was incorporated August 4, 1944, to operate the branch line railroad running from the junction with the G. M. & O. railroad near Columbia, Ill., to Millstadt, Ill. The railroad is not part of the quarry property, but it will serve the quarry of the company at Krause, Ill., a coal mine at Millstadt, an elevator, a mill, a lumber yard, and an asphalt plant. The rail-



Worked out area of limestone mine owned by George W. Kerford Quarry Co., Atchison, Kans., which has been leased to the U. S. War Food Administration as a cold storage "warehouse."

road is 7.66 miles long, with 9 miles of track, and has prospects of doing a business of 500,000 tons a year. An application is now before the Interstate Commerce Commission to operate the line.

## Chile Public Works Program

TO AVERT any possible economic disruption arising from reduced Chilean copper, nitrate and mineral production after the war, the government of Chile has a public works program calling for the expenditure of \$340,000,000. Railroads, highways, bridges, water and irrigation systems, harbor improvements, housing and other projects are on the list.

## Quarry to Move

STURGEON BAY Co., Cleveland, Ohio, plans to open a new quarry on Drummond Island at De Tour, Mich. Equipment from the Sturgeon Bay, Wis., plant will be used at the new quarry. Major production from the Drummond Island quarry will be shipped to the Dow Magnesium Corporation at Ludington, Mich., where the dolomite will be used in the production of magnesium metal. The Sturgeon Bay Company expects to retain its quarry properties at Sturgeon Bay, Wis., but plans for operation of the properties in the post-war period have not as yet been definitely concluded.

## Cement Power Plant

PACIFIC PORTLAND CEMENT Co., San Francisco, Calif., is constructing a power plant on Rogue river at Gold Hill, Ore. The plant will provide power for the cement plant and possibly for Gold Hill street lighting and other municipal uses.

## Limestone Mine for Cold Storage

WHAT is believed to be the largest cold storage warehouse in the world will be located near Atchison, Kans., when the George W. Kerford Quarry Co., limestone mine is taken over by the government to store supplies of lard, dried eggs, dried milk, fats and other products. The War Food Administration will contract with a firm familiar with refrigeration to operate the plant which will be opened August 1. About 12 million cubic feet of space will be available for storage. Normal temperature in the mine is about 50 degrees which will be reduced to between 28 and 32 degrees. Mining operations will be continued without interruption.

## Start Ready Mix Operations

JOHN A. DENIE'S SONS Co., Memphis, Tenn., is now operating a ready mixed concrete batching plant having a capacity of 100 cu. yds. per hour. Morrie Moss is president of the company.

## Propose Crushing Plant

CRAIG COUNTY, Okla., plans to open up a quarry on the Ed Bond ranch, located five miles east and one mile north of Vinita, Okla., and set up a plant for the production of agricultural limestone and road stone. C. A. Wagner Construction Co., will construct the plant and open the quarry, according to a local report.

## Purchase Gravel Concern

SOUTHERN MATERIALS CORPORATION, Richmond, Va., has purchased the Richmond Sand and Gravel Corporation.



# HINTS *and* HELPS

Practical Ideas Developed by Operating Men

## Air-Operated Bin Gate

A UNIQUE DEVICE for opening and closing a hopper discharge gate is in use at the Flint Crushed Gravel Co., Des Moines, Iowa, and has



Air hose lines on trolley connected up to air pressure tank on locomotive supply compressed air to operate plant bin gates

proven to be a time and labor saver.

This company operates a dredge which pumps sand and gravel into a hopper from where it is transported by rail to the screening and crushing plant. To facilitate car loading, H. W. Kelly, superintendent, conceived the idea of utilizing the compression tank which supplies air to the air brakes of the locomotive for opening and closing the bin gates.

A pair of cylinders, 5½ in. in diameter, made from the discarded sleeves of a Caterpillar Diesel engine, were fitted with ¾-in. steel plates for

cylinder heads. These plates were held in place by four ¾-in. rods. Inside the cylinder, ¾-in. steel plates, the diameter of the bore, were welded to the outer plates. Ordinary 5¼-in. cup leathers, for a tight seal between piston and cylinder, were mounted on piston rods with ¾-in. plates on either side of the cup leather to act as guides. Gasket material was used as a seal for the heads.

The cylinders were then mounted on the bin structure, one on either side and opposite the bin gate, and at the same elevation. A 2½-in. pipe was connected to the piston rods of the cylinders, with a coupling device connecting the pipe with the gate lever of the hopper. Two 25-ft. lengths of 1¼-in. steel pipe were connected, one to each cylinder, and placed at right angles to the cylinders, parallel and to one side of the tracks which ran under the bin. Two 25-ft. lengths of ¾-in. rubber air hose were connected to the pipes and the open end fitted with a Jiffy connection which would allow union with a connection on the 7¼-ft. air brake compressor of the locomotive, when the cars were in place for loading. The Jiffy connections enable the union to be made in just a few seconds.

The open ends of the hose were mounted on a trolley, which runs on a ¾-in cable to allow the locomotive to move to various positions within a distance of 50 ft. from the hopper while loading.

When a car is in position for loading, the operator of the locomotive connects the open ends of the hose to the compressor or tank and introduces air into one cylinder, through the hose, by means of a hand operated lever. The air com-

pression pushes the piston of the cylinder out which opens the hopper gate. Compression is then released and the gate remains open until the car is filled, at which time air is introduced into the other cylinder by means of another lever, which closes the gate.

A 9- x 34-in. air tank in the locomotive is kept up to 110 p.s.i. pressure by the compressor. This tank, by experiment, is shown to be an efficient size for this type of operation, since it will build up sufficient air pressure rapidly, thus allowing enough pressure to be maintained to keep the brakes of the locomotive on as well as having enough compression to operate the gates. A larger tank would not build up pressure rapidly enough to keep the head of air in the tank.

This device not only saves time in loading cars, but also saves spillage since the gates can be closed more rapidly and more tightly. It also enables the operator of the locomotive to open and close the gates without dismounting from his position at the controls.

## Removing Steam Vapor from Curing Rooms

A NOVEL METHOD of drawing steam from curing rooms is in use at the Concrete Building Units Co., plant in Kansas City, Mo.

A 30- x 30-in. concrete tunnel was constructed above and at right angles to the closed ends of the curing rooms. An opening through the ceiling of the rooms into the tunnel, controlled by a gate valve, allows passage of the steam through the tunnel to a discharge stack. An American Blower fan, located at each end, draws off the steam. The doors to the curing rooms are opened a few



Left: H. W. Kelly, superintendent, standing alongside trolley which allows movement of air hose.



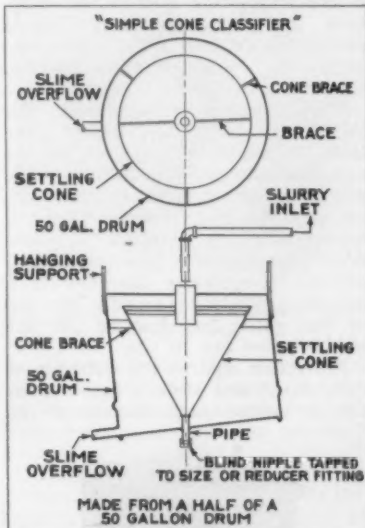
Right: Close-up of bin gates showing, above, air-operated pistons on each side of bin gates

inches, after the curing period, at the same time as the fan is turned on, which quickly draws the steam away from the plant proper, and eliminates the discomfort to the workers.

## Cone Classifiers

By J. F. PRUYN

IN THE ACCOMPANYING SKETCH may be seen a simple cone classifier which can be made from half of an old 50-gal. drum. Due to war-time restric-



Plan and elevation of simple cone classifier

tions some plants in need of this equipment cannot turn to the usual manufacturing source for this apparatus, and the simple equipment shown can fill in as a stop-gap until something better is available.

A series of five of these cones were made to feed flotation cells and concentrating tables in a 150-ton capacity mill.

## Turntable and Pivot Chutes

PRACTICABLE arrangements for chuting granular materials are a necessity where an aggregates producer has a number of bins and produces a variety of products. The accompanying illustration, taken at the Richmond, Ind., plant of the American Aggregates Corp. illustrates two chute devices that are unusually simple to operate.

The one is a turntable affair for filling either of four truck-loading bins with gravel conveyed from the main screening plant by belt conveyor. The chute can be turned easily about a central axis exactly centered between the openings into each of four bins. It will be noted that each bin opening has a square collar to which the bottom end of the steel chute is bolted by a metal strap. All the operator has to do, to change bins, is to unbolt the strap, turn the chute, and re-bolt the strap to the



Left: Pivoted chute which permits diversion of sand to either of two bins. Right: Swivelling or "turntable" chute to fill any of four truck-loading bins with gravel

collar around either of the other bin openings.

The other chute illustrated (same photograph) is a two-way swing chute, with the chute turning on a horizontal axis to either of two positions. In this case, sand is being filled into a bin in the foreground. To fill the second bin, it is a simple matter, after stopping the feed from an overhead conveyor belt in this case, to lift the lowered end of the chute to a raised position, in which case the sand (or other material) will flow into the other bin. The device can be shifted by hand, and the weight of the flowing material will hold the chute in place.

## Quarry Cars from Boilers

DISCARDED steam boilers have been put to practicable service by cutting them into quarter sections, converting these sections to use as mine cars. The Fort Dodge Limestone Co., Fort Dodge, Iowa, had two 44-in. diameter boilers, which were cut in the shops into two 66-in. lengths. Plates were welded to the open ends of each section, and 8-in. plates were welded to the sides to give greater height to each car. The cars were mounted on 12-in. diameter roller bearing wheels



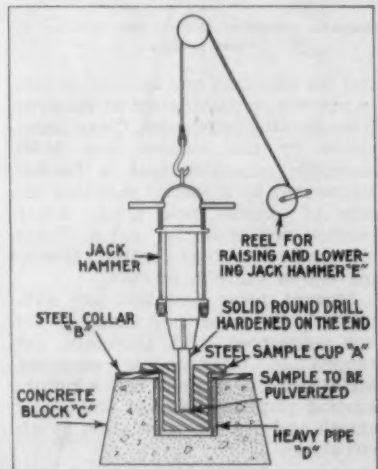
Quarry cars having bodies made from sections of old steam boilers

spaced to run on 36-in. gage track. Each car has a capacity of about two tons. These cars have met the emergency until other more permanent types of equipment may be available.

## Pulverizing Tough Rock

By JOHN F. PRUYN

A LARGE WESTERN CONCERN found that time and money can be saved by pulverizing tough rock samples for analysis with a jackhammer. As shown in the illustration, the steel



Showing how jackhammer is used to pulverize rock sample

cup (A) is made of a piece of 8-in. shafting, a 2-in. hole is drilled in this to take the sample. This assembly is completed by welding a collar around the cup.

A 1-in. thick plate collar (B) is anchored to the concrete block (C) after a 9-in. piece of heavy pipe (D) has been inserted. The reel adjustment (E) aids in adjusting the drill.

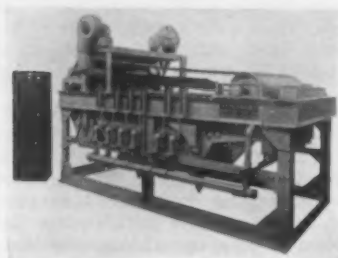
# NEW Machinery

## Magnetic Separator

STEARNS MAGNETIC MANUFACTURING Co., Milwaukee, Wis., recently developed a magnetic separator which is said to have some distinctive and exclusive features. It will be used principally for concentrating ores and minerals by the wet process.

Material goes into a simple enclosed spout and a controlled water pressure feed. This creates a high disseminating effect to spread the material in a thin, uniform layer to the underside of a submerged moving belt. Here it is picked up by the intercepting magnetic field and carried through the successive magnetic zones individually controlled by rheostats which provide a clean product of concentrates, middlings and tails.

Water sprays are of ingenious design and conveniently located to con-



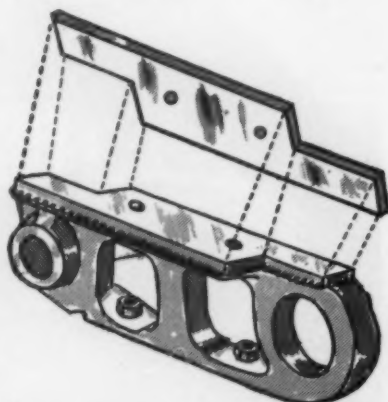
Magnetic separator concentrates minerals by wet process

trol the direction and amount of flow to prevent contamination of material from floating impurities. Clean separation by the Stearns type MWI magnetic separator unit is further augmented by a special patented design of magnet pole pieces which subject the material to a zigzag movement as well as a rolling, cleansing action while in process.

Magnet poles and belt are submerged while the coil windings are not submerged, and, therefore, not subject to moisture or sweating. Metal jackets protect coil windings against physical damage and water splash and provide ventilation by air circulation.

## Welding Tractor Links

ALLIED STEEL PRODUCTS, INC., Cleveland, Ohio, has developed a special steel which permits the salvage of tractor link castings by welding on to the rail surface a special steel plate, restoring the worn casting to its original weight and thickness. These plates are fabricated to correct sizes to fit the track link casting and are affixed by gas or electric welding. A special work-hardening

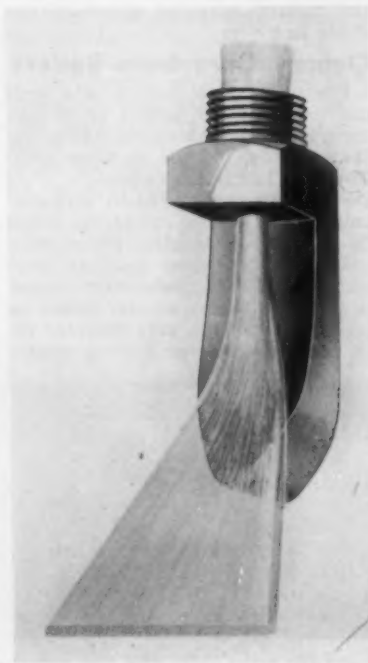


Showing how special steel wear plate is applied by welding to worn tractor link casting

steel is used for these plates. Plates are available for many makes and models of tractors.

## Flat Jet Spray Nozzle

SPRAYING SYSTEMS Co., Chicago, Ill., has developed its FlatJet spray nozzle which is said to be particularly adaptable to washing crushed stone or gravel. It provides a flat spray with sharply defined edges and uniform distribution. A number of sizes are available. For example, in spraying water at 40 lbs. pressure, a choice may be made of 20 different nozzles. These range in capacity and spray



Flat spray jet for washing aggregates

angle from 1 g.p.m. and a 15-deg. spray angle to 20 g.p.m. and a 35-deg. spray angle.

## Outdoor A-C Welders

GENERAL ELECTRIC Co., Schenectady, N. Y., has announced two new outdoor alternating-current welders, a 500-amp. type and a 300-amp. type. The 500-amp. welder has a current range from 100 to 625 amps., while the range of the 300-amp. welder is from 60 to 375 amps.

These welders are equipped with an "idleomatic" control which functions to reduce the output voltage automatically to less than 30 volts whenever the arc is not in operation, yet provides full power for welding directly the arc is struck. In addition, this control is provided with a switch, conveniently operated by a handle projecting through the top of the case, for shutting off the welder when not in use.

Protection against the entrance of rain, snow, and sleet is provided by the dripproof construction of all



Welder for outdoor service has built-in power-factor improvement, finger-tip adjustment, and stepless current control

openings in the top of the sturdy enclosures of the welders, and by a sealed window over the current indicator. The ventilating openings serve both to shed water and to keep air velocity low. A special finish on all internal parts provides protection against corrosion from moist air.

## Crane-Excavator

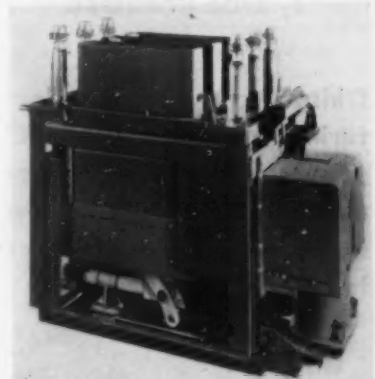
THE GENERAL EXCAVATOR Co., Marion, Ohio, has announced the development of a combination crane-excavator which, it is claimed, will revolutionize small construction, excavating and materials-handling jobs. Known as the General Type 10, the new equipment will not be released for production until after the war.



## NEW MACHINERY

## Magnetic Type Air Circuit Breaker

**ALLIS - CHALMERS MANUFACTURING Co., Milwaukee, Wis.,** is now in production on its "Ruptair" magnet type air circuit breaker which is available in high voltage, oil-less switchgear



**Circuit breaker for use in vertical-lift, metal-clad switchgear equipment**

rated 5000 volts and below and 150,000 kv.a. interrupting capacity and below. This breaker has overall dimensions as compact as standard oil breaker switchgear.

In this type arc breaker the arc chute has been coordinated with the contact and arc runner design to give consistent interruption through the entire range of current to be interrupted. The magnetic circuit, consisting of a blowout coil and two laminated iron pole pieces per phase, is arranged to force the arc up into the arc chute immediately upon separation of the arcing contacts.

### Angle Meter

INTERSTATE SALES Co., New York, N. Y., is distributing the Wolfe angle meter, shown in the illustration, for use by engineers, draftsmen, welders, and sheet metal workers. With this meter the man on the job may lay out directly on pipe or flat material any angle bend from 0 deg. to 125 deg. Using a method of measuring in both directions from a center line, it requires only four measurements to mark a pipe or stretch out in 16 different points on the circumference. All measurements are taken from the right-hand side of the pointer to the zero line.

Where the lines are not calibrated, a rule is placed with the end against the right-hand side of pointer and the measurements read at the zero line. The rule should be held parallel to the nearest existing horizontal line. Complete instructions for its use come with the angle meter.

Although the angle meter is laid out to give direct reading for pipes up to 20 in., by using the proper multiple the range is unlimited. For ex-

ample with 28-in. pipe, use the 14-in. pipe as basis. At 71 deg. on arc No. 1, for instance, the 14-in. pipe gives reading 5 in.; on the 28-in. pipe therefore multiply by 2, giving 10 in.

## Rechargeable Flashlight

THE B. F. GOODRICH CO., Akron, Ohio, has placed on the market a rechargeable wet flashlight battery for industrial uses built on the principle of the automobile wet storage battery which is said to be especially valuable for operations where long continued and steady usage is necessary.

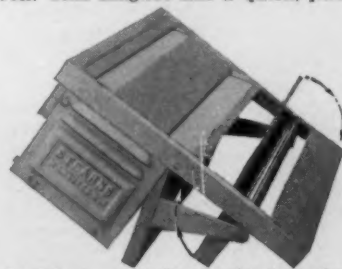
Where batteries require replacements more than once every two weeks, the new battery is said to be more economical. The batteries give the same light as the industrial type dry cells; a freshly charged wet battery will give about three hours of constant light. Batteries can be used in the standard three or five-cell dry battery case with the use of spacer plugs.

The new battery requires a special Mazda lamp, which comes in 1.9 volt, .6-ampere of screw base and flange base design. This is a 600 mil lamp as contrasted with the 300 mil lamp used with dry batteries. The light is constant, since the voltage drop between full charged and discharged wet cell battery is only .35 volts; the

dry cell drops approximately a full volt.

### Spout Magnet

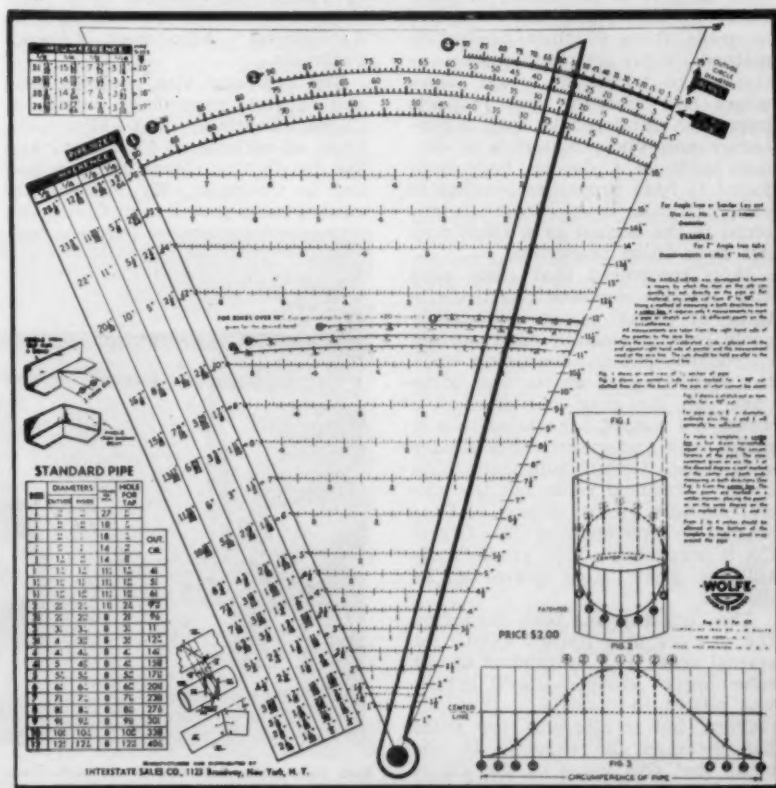
STEARNS MAGNETIC MANUFACTURING Co., Milwaukee, Wis., has brought out a spout type magnet known as the Super Class "AAA" to remove tramp iron. This magnet has a quick, posi-



**Scout type magnet for removing tramp iron**

tive acting armature which insures opening and closing of tramp iron discharge gate which is entirely automatic, opening when current is shut off and closing when current is turned on.

The spout magnets are furnished in widths from 8 in. to 20 in., in the "AAA" series but can be had in larger sizes for coal and other industries requiring giant types. Where direct current is not available rectifiers are furnished to suit size of spout magnet.



Showing how angle meter is used to lay out angle bend of pipe

# By-Products

## Making AGSTONE from Gravel

By BROR NORDBERG



Shovel loading from main excavation into truck. This deposit is the source of material for agricultural "meal"

**Ohio Gravel Co., manufacturing "agricultural meal" as a by-product to its normal gravel crushing operations. Adds new crushers to increase capacity**

at Miamiville as well as at Newtown, but on a smaller scale and by the wet process formerly used at Newtown. This article is confined to the latter operation, since the bulk of the tonnage is produced there and the same general principles apply at the others.

### By-Product of Gravel Crushing Operations

In discussing the production of pulverized agricultural meal from gravel, at Newtown, we first want to point out that its production is incidental to the production of commercial gravel. However, during the last few years there has been a heavy demand for crushed gravel in the finer sizes, which requires setting crushers up close. More fines minus 8-mesh are therefore produced. The plant has a production of 200 t.p.h.

**W**E have frequently urged in the pages of *Rock Products* that producers of aggregates take inventory of their raw materials, chemically as well as physically, in order better to exploit their materials and to guide them in their production methods. There are many notable instances to which we could point, where new uses for rock products have been developed by such a procedure and where materials in certain parts of a deposit have been found to have properties peculiar to some particular usage, where the material in the deposit as a whole does not have those properties.

It is recognized that some sand and gravel deposits, particularly those of glacial origin, conceivably could have a relatively high calcium carbonate content, depending upon the native stone which was borne down by the great ice sheet. We would not hazard a guess as to how many sand and gravel deposits have a carbonate content sufficiently high to have chemical value, but the glacial deposits in the vicinity of Cincinnati do have and the Ohio Gravel Co. is producing a high grade "agricultural meal" from gravel in its deposits.

The company has been producing the product to a limited extent for several years, as a by-product to wet screening of crushed gravel, which was settled in ponds and then reclaimed, but in the past few years has increased its capacity to the point that this phase of the gravel business is considerable. The bulk of the production is at the Newtown,

Ohio, plant, just outside Cincinnati, where the product is produced by a dry process of screening and crushing. Approximately 25,000 tons of "Ogco" agricultural meal were shipped from this plant in 1943 on Agricultural Adjustment Agency Contracts.

The company also operates sand and gravel producing plants at Cleves, Loveland and Miamiville, Ohio, all suburbs of Cincinnati, and has distributing plants in Cincinnati and in Covington, Ky. Agricultural meal is being produced at Cleves and



Main plant of the Ohio Gravel Co. Note crane in right background for feeding stockpiled pebbles into crusher bins. On left side of plant may be seen bins supporting screen for crushed gravel with draw-off conveyor belt for carloading

## BY-PRODUCTS

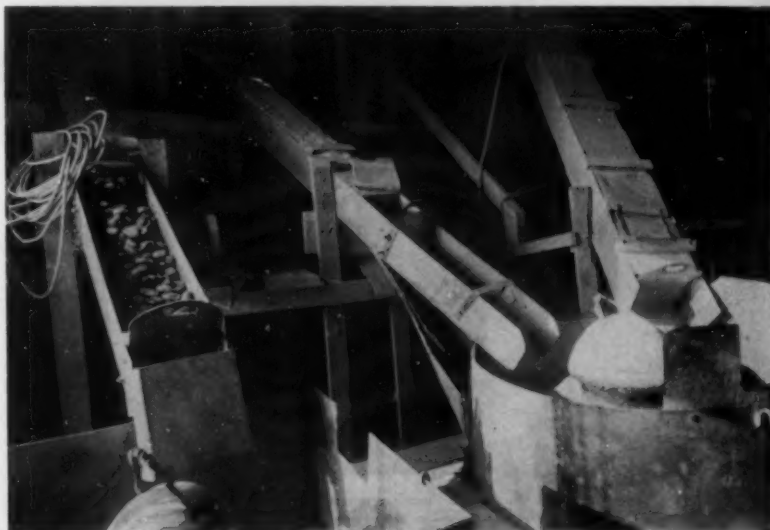
of which approximately 20 to 25 t.p.h. is agricultural meal, when crushed gravel is produced. Probably one-fourth of all crushed particles are in the agricultural meal size range.

"Ogco" agricultural meal is guaranteed to contain a minimum of 23.5 percent calcium oxide and 5.5 percent magnesium oxide and must have a minimum calcium carbonate equivalent of 80 percent to pass local A.A.A. specifications. The product averages 85 to 88 percent carbonates, well over the minimum requirements. The sieve analysis of the finished product is guaranteed to equal or exceed the following:

Passing No. 8.....	90 percent
Passing No. 20.....	50 percent
Passing No. 60.....	30 percent
Passing No. 100.....	20 percent

Ohio Gravel Co. has been producing sand and gravel at Newtown since 1931, and has extensive holdings of land in the area. The deposits are said to have been laid down by the great glacier as it progressed southward, carrying materials from the northern states. Evidently, it picked up great quantities of limestone, that was harder and more resistant to abrasion than other minerals it carried.

The sand in the deposits is unsuitable for processing into liming materials and it is necessary to crush particles over No. 4 mesh size to meet the chemical requirements. Silica and alumina content are too high in the lower sizes, and they comprise the principal impurities in the finished product. However, these minerals are also beneficial to the soil. As pebbles increase in size above No. 4 mesh size, the carbonate content



Showing how crushers are fed in main plant. The chutes lead to the gyratory crushers. Pebbles in one of the chutes show a typical size of raw material from which "meal" is made

becomes increasingly greater. The bulk of the meal is produced from gravel pebbles in the 1- to 2½-in. size range.

The main deposit has a 70-ft. face running 60 percent sand, which is excavated by a 1¾-cu. yd. Northwest electric shovel. Haul to the main plant is by a combination of trucks, hoist-drawn industrial cars and a belt conveyor, covering a total distance of about three-fourths of a mile. The trucks dump through a grizzly, with 8-in. spacings, into a hopper which fills the industrial cars. These cars transfer to a belt conveyor, 400-ft. centers, which spans a highway into the plant.

Since agricultural meal is produced incidental to commercial aggregates, it is necessary to outline briefly the plant flowsheet. There are several interesting features about it, aside from production of agricultural meal. One is that a supplemental plant is operated near the main plant, entirely independent, but to produce certain crushed gravel along with agricultural meal. The second interesting feature is that there is provision to stockpile raw materials alongside bins over the crushers to supplement the flow of crushable pebbles entering the plant over the previously-mentioned belt conveyor.

In connection with this operation, a second excavation has been opened about two miles from the plant in a deposit carrying 80 percent plus 1-in. pebbles. A "de-sanding" operation has been set up in this location, consisting of a portable unit built on an old Marion shovel frame. All minus 1-in. material is screened out and stockpiled by a stacking belt conveyor (and sold for road base work, etc.) and two sizes of pebbles, 8- to 2½-in., and 2½- to 1-in., are placed in bins for truck delivery to the main plant.

In this way, a shortage of crushable particles from the main excavation can be supplemented, as needed, when the demand is heavy for crushed gravel, and a reserve is also provided against shutdowns in the main excavation. A clamshell simply places the gravel into bins over the crushers, which are arranged in a row with separate bins feeding them. The crushers are a Gates No. 5, a 36-in. Stedman impact-type reduction crusher, a No. 6 McCully gyratory and a No. 25 Kennedy gyratory, arranged in a row for discharge to a single belt.



Close-up of 36-in. impact type crusher. On the left are the two gyratory crushers in a line with another gyratory (to the extreme right, not shown); all fed from bins and discharging to a common conveyor belt





A 30-in. impact type reduction crusher for making fine crushed gravel products and agricultural "meal." On the left is the elevator to screen over bin in the auxiliary plant

### Main Plant Flowsheet

Incoming pit run material, from the main excavation, is first put through a 5-ft. diameter trommel screen. Plus  $3\frac{1}{2}$ -in. boulders are screened into a bin from which the Gates crusher is fed. Minus  $3\frac{1}{2}$ -in. material is then screened over a 3- x 10-ft. Simplicity triple-deck vibrating screen. Generally, two arrangements of screen cloths are used on this screen in producing uncrushed gravel. In one, these are  $1\frac{3}{4}$ -, 1- and  $5/16$ -in. square opening screen decks from top to bottom consecutively. Gravel retained on the second deck is Ohio No. 3 gravel and on the third deck is Ohio No. 4 gravel. The throughs are passed over a 3- x 6-ft. single-deck vibrating screen to screen out a  $1/2$ - to  $5/16$ -in. product sold for the manufacture of concrete block, and minus  $1/2$ -in. material and water is laundered into a sand drag.

As an alternate, the same screen will have  $1\frac{1}{2}$ -in., 1-in. and No. 4-mesh screen decks to produce Ohio 3A gravel and  $3/8$ - or  $1/4$ - to 1-in. gravel. The single-deck screen is utilized to produce snow sand ( $5/32$ - to  $1/4$ -in.) or a  $1/8$ - to  $1/4$ -in. product. When making these fine products on the single-deck screen, it is sometimes necessary to divert some of the retained material into the sand drag. A  $5/32$ -in. minus plastering sand is also produced.

Under present marketing demands, all gravel over 1-in. size is usually crushed. Various sizes of pebbles,  $3\frac{1}{2}$ - to 8-in.,  $1\frac{3}{4}$ - to 1-in. and sometimes 1- to  $5/16$ -in., to be crushed, flow through chutes into the bins over the crushers, with the biggest gravel to be fed the largest crusher, etc. The 36-in. impact-type reduction crusher was installed in 1942 to improve particle shapes and to increase the output of fine products.

It is driven at 1450 r.p.m. through V-belt by a 75-hp. motor. Generally, this machine is fed  $1\frac{3}{4}$ -in. minus gravel. All the crushers are set up close since the principal demands are for  $3/8$ - to  $1/2$ -in. crushed gravel,  $1/2$ - to  $3/8$ -in. crushed gravel and Ohio No. 46 which is a blend of the two, either mixed through chutes into bins or on the carloading belt from the bins. These products are used in cold asphalt mixes, for patchwork or in road mixes. A  $3/8$ - to  $1\frac{3}{4}$ -in. crushed gravel is also produced for county roads.

There is also a demand for  $3/4$ -in. minus road gravel, in which case all the fines from crushing must be included. Approximately 15,000 tons of agricultural meal over the 25,000 tons shipped in 1943 were produced in 1943 that had to be incorporated into road gravel. Therefore, special efforts are directed to moving the finer graded products since the agricultural meal produced incidentally to it is profitable.

All the crushers discharge on to a 24-in. horizontal belt conveyor for transfer to a bucket elevator that feeds a 4- x 12-ft. Robins Elliptex 3-deck vibrating screen where  $3/8$ - to  $1/2$ -in. and  $1/2$ - to  $3/8$ -in. crushed gravel are sized and placed in bins. Material passing the  $3/16$ -in. circular openings in the bottom deck is agricultural meal, which is trucked direct from the bins. All oversize from the screen is re-circulated back to the impact-type reduction crusher.

The auxiliary plant, near the main plant, is set up to produce Ohio No. 6 and agricultural meal. It consists of a 30-in. Stedman impact-type reduction crusher, a 3- x 10-ft. triple-deck Niagara vibrating screen and an overhead hopper fed  $1\frac{3}{4}$ -in. pebbles from stockpiles by a crane. This plant will produce 30 to 35 t.p.h. of Ohio No. 6 crushed gravel and 5

t.p.h. of agricultural meal simultaneously. Across the highway from the main plant are extensive stockpiles of agricultural meal and other products, trucked from plant bins. A Haiss bucket loader or a Northwest crane loads trucks from these stockpiles. However, normally trucks are loaded from the plant bins.

Agricultural meal is hauled in dump trucks and spreader trucks which are operated under contract and deliveries are made into four Ohio counties and across the Ohio river into Kentucky. Occasionally, some has been shipped by rail.

Before going into the production of agricultural meal, the company had had its gravel analyzed at Ohio State University. Periodic chemical analyses are made by the H. C. Nutting testing laboratory.

Fred W. Cornuelle is president and general manager of the Ohio Gravel Co.; Walter J. Flach is vice-president; Ray Hicks, secretary; and N. R. Birchall, treasurer. G. E. Nash is superintendent at Newtown.

### Seeks Agstone Information

ADMINISTRATIVE DIRECTOR J. R. Boyd of the National Crushed Stone Association has addressed a questionnaire to the membership, seeking information about agricultural limestone production for presentation to officials at Washington, D. C., concerned with the war food program. He has urged the members to send to the office of the Association in Washington, the answers to the following questions:

1. During normal years do you produce agricultural limestone as a primary product, or as a co-product along with other limestone commodities?
2. In order to maintain or increase your output of agricultural limestone have you had to shift to the primary production of this material? If so, when was the shift made?
3. What percentage of your present agricultural limestone production is made as a primary product?
4. If you are planning to shift to the primary production of agricultural limestone, when will that shift be made?
5. From the standpoint of tonnage, how does your 1944 rate of agricultural limestone production compare with 1943 and 1942?
6. List in order of importance the three most weighty factors that may be preventing you from maintaining or increasing your output of agricultural limestone. An immediate reply will be greatly appreciated.

### Mica Has AA Rating

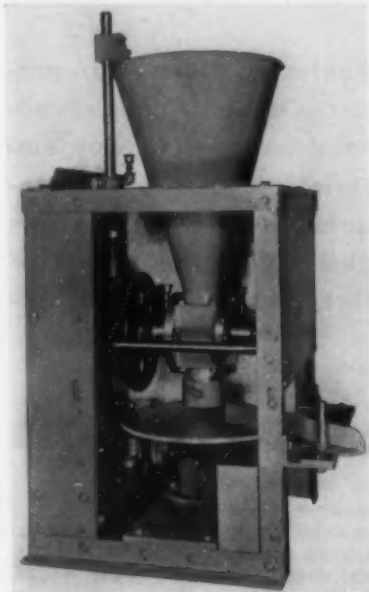
MANPOWER priorities of "AA," the highest possible rating, were assigned the strategic mica industry in the Asheville, N. C., labor market area.

# Chemists' Corner

## Feed Cement Admixtures Uniformly

Solving problem of feeding Vinsol resin into portland cement at the cement mill

By J. F. BARTON\*



Machine used to feed Vinsol resin to portland cement at a uniform rate

**C**EMENT MILL CHEMISTS have been confronted from time to time with the problem of feeding accurately very small quantities of certain chemical ingredients, organic and inorganic, into portland and masonry cements. The necessity for a uniform, continuous flow of this type of addition is keenly appreciated by cement mill supervisors. Uniformity of additions insures a well-blended, higher quality cement than when the additions are allowed to be added intermittently or in cycles. If the chemical addition is a plasticizing agent for masonry cement, uniformity in percent of the plasticiser is essential to produce a product which will reflect uniform workability.

One of the more recent problems to confront the chemist is the addition of a small quantity of Vinsol resin in portland cement. The amount of addition is designated by specifications. A.S.T.M.-E.A.C.-150 Types 1 and 2 and Federal specifications E SS-C 191b and E SS-C 206a limit Vinsol resin content in cement to 0.025 percent to 0.045 percent based on the weight of the cement. If the chemist elects to strive for an average percentage, for example, 0.030 percent addition, then he must add one part resin with 3342 parts of cement material. To elaborate a little farther 0.030 percent Vinsol resin addition

requires 1.8 ounces of resin to be blended with 375 lbs. 14.2 oz. of cement material to make one barrel of 376 lbs. If one assumes that an average grinding unit will produce 60 bbls. of cement per hour then 108 oz. or 6¾ lbs. of Vinsol resin must be fed continually and proportionately over a period of one hour with 22553.25 lbs. of cement material to produce 22560 lbs or 60 bbls. of a homogeneously blended Vinsol resin cement. Reducing this Vinsol resin feed rate to terms better understood by the chemist 51 grams per minute would be the rate desired. To accomplish such a small feed rate as this, obviously requires special equipment or costly expenditure of man hours.

The Barton materials feeder was invented, and the idea first put into use in June, 1942. It has proved successful in the handling of powdered and flake Vinsol resin, calcium stearate, aluminum stearate, hydrated lime and carbon black. It is believed by the inventor that the principle involved in the machine is equally adaptable to many other dry light weight materials and particularly adapted to the resins and other organic acids which exhibit a sticky nature. Very light weight, fluffy, free flowing material such as hydrated lime is handled with ease.

### How Feeder Operates

My materials feeder consists essentially of a supply hopper or reservoir connected with a feeding device and a horizontal revolving plate. Agitation is provided inside the reservoir which insures positive flow of material into the feeding mechanism. The feeding mechanism controls and delivers the materials in measured quantity to the revolving plate. A special adjusting medium is provided to permit regulation of the position and rate of flow of material to the plate. A micrometer adjusting plow is provided for the purpose of further adjustment for ultimate quantity and for diverting the material from the revolving plate into the grinding system.

This feeder is primarily designed for use in connection with all types of clinker feeders. It is adaptable to

all types of clinker feeders. Due to the slowness of operation of this feeder when feeding small quantities such as is the case with Vinsol resin, a gear-head motor is required to drive the mechanism if an independent drive is desired. However, when proportioning two or more ingredients as is done in any portland cement grinding operation, a higher degree of blending is assured when all feeding mechanisms are synchronized to a central drive. In this type of feeding arrangement, uniformity of blending is not thrown out of balance as is the case with independent feeding. With independent feeding, the feed rate of one material can change radically with no change being affected in the speed of the other mechanism, however, a central drive causes a proportionate rate change if the main drive mechanism is changed in speed. It is recommended that the feeder be synchronized with central feeding control.

The design of this feeder is such that it permits operation at a much higher rate of speed than is necessary when feeding Vinsol resin. The feeder has a wide range of limited capacity for feeding various materials depending on speed of operation. When operating at reduced speed the range in feed rate capacity can be varied from zero grams per minute to 300 gr. per minute. This range provides sufficient capacity to accommodate a cement production rate of approximately 360 bbls. per hour.

The supply reservoir on the present model has a capacity for ten hours of Vinsol resin requirement at 60 bbls. per hour production rate when feeding 0.030 percent resin.

Two feeders are now in operation with powdered Vinsol resin, and they are showing a feed rate variation of less than one gram per minute.

Recent development in the feeding of Vinsol resin in the liquid or neutralized form is rapidly being adopted by portland cement manufacturers in the hopes of overcoming some of the difficulties encountered in feeding dry resin. This method, however, is not without its problems and uniformity in feeding. Further study of the neutralized Vinsol resin feeding problem promises some interesting material for future discussion.

\*Chief chemist, The Federal Portland Cement Co., Inc., Buffalo, N. Y.



Exterior view of Tyrone plant, showing mine shaft to the right

By RALPH S. TORGERSON

Kentucky Stone Co. produces large tonnage of railroad ballast, highway materials, concrete aggregates, and agstone in nine plants, six having mines and three operating quarries

## Convert Quarries to Mine Operation

LOOKING at the map of Kentucky one is immediately impressed with the fact that Kentucky Stone Company operations are strategically located on all railway lines radiating out of Louisville. This is particularly significant as most of these plants were originally constructed for the production of railroad ballast, but in more recent years additions in crushing, screening, and pulverizing equipment have been made to meet the more complex specifications for highway and commercial stone.

Of the nine plants in operation, three, Upton, Irvington, and Mt. Vernon, are quarries, and six, Tyrone, High Bridge, Yellow Rock, Mullins, Russellville, and Lilmay, are mines. In addition to the quarry operation at Irvington for commercial stone, there is also a separate oolite mine.

Today all nine plants are busy producing railroad ballast and a considerable volume of highway and commercial stone. Agricultural limestone is produced in large quantities at all plants. Ballast specifications of the railroads served by these plants in general follow A.R.E.A. specifications but differ considerably in detail although they all come within the top size of  $2\frac{1}{2}$  in. and a minus size of  $\frac{1}{2}$  in. Kentucky highway specifications involve 14 standard grading requirements, and range from a top size of  $3\frac{1}{2}$  in. down to minus No. 4 mesh. Standard size No. 1, for example, calls for 100 percent passing 4 in., 90 to 100 percent passing  $3\frac{1}{2}$  in., 25 to 60 percent passing  $2\frac{1}{2}$  in., and 0 to 15 percent passing  $1\frac{1}{2}$  in. The No. 11 size, on the other hand,

requires 100 percent passing  $\frac{3}{8}$  in., 80 to 100 percent passing No. 4 mesh, 0 to 15 percent passing No. 8 mesh, and 0 to 3 percent passing No. 20 mesh. In between these extremes are 12 other gradations which have added to the complexity of plant operations.

The Kentucky A.A.A. agricultural limestone specifications require 94 percent  $\text{CaCO}_3$  equivalent, and a gradation of 20 percent minus 100-mesh, 30 percent minus 60-mesh, 70 percent minus 20-mesh, and 90 percent minus 10-mesh. It is of interest to note that the Kentucky Stone Co., has not depended upon direct war contracts for business, and with the exception of the Blue Grass ordinance plant job the demands have come mainly from essential peacetime industries, including ballast for



Left: Hoist to elevate 4-cu. yd. mine ship car at Tyrone. Right: Chute constructed of steel rails at top of mine shaft where cars are dumped to primary gyratory crusher, shown to the left





Left: Tunnel mine openings into face of old quarry operations at High Bridge. Right: Mine openings at Mullins. Note train of quarry cars pulled across bridge by gasoline locomotive

railroads, highway stone, and agricultural limestone.

## From Quarry to Mining Operations

Practically all the operations were started as quarries, but with increasing costs for removal of overburden and the desirability of obtaining a cleaner stone under better working conditions the company decided to open tunnel mines. Only three quarries now remain in operation.

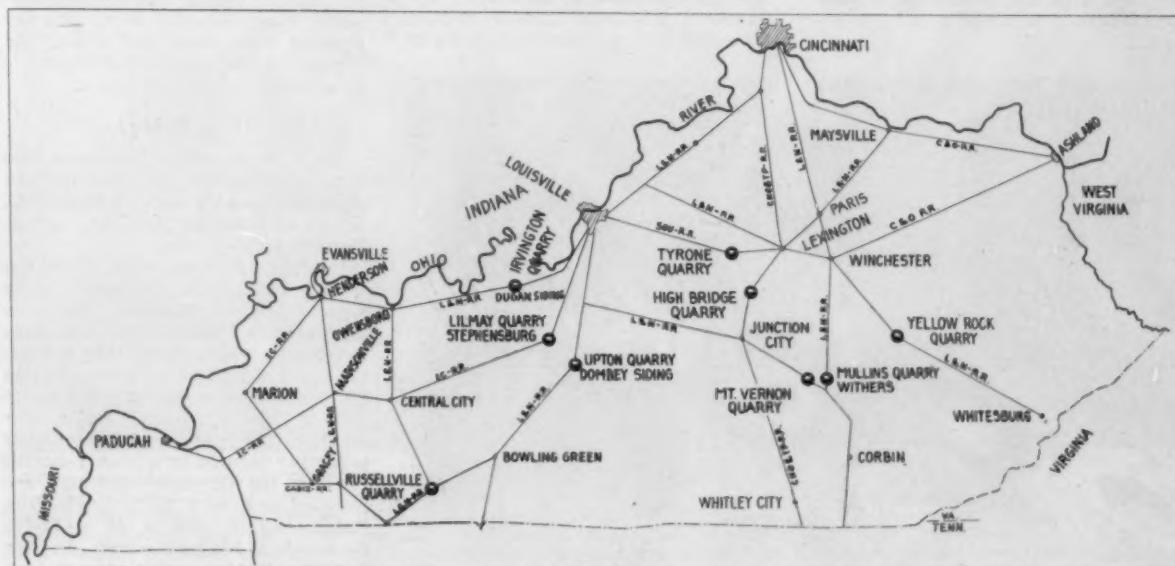
Drilling, blasting, loading and haulage practices in all six of the mines are somewhat similar. The room and pillar method is employed with headings about 28 ft. high and 38 ft. wide and pillars about 75 to 100 ft. apart. Headings vary, of course, depending upon conditions found in the individual mine. Headings are drilled with

Cleveland and Sullivan wagon drills, and the ceilings are drilled with Sullivan Stoppers, Class SS10. On each side of the center line of the heading, a row of holes is drilled vertically up the face and converging toward the center to form a V. Three other rows of holes are drilled on each side of the rows forming the V. Holes are spaced about 4½ ft. apart. All air for drilling purposes is piped to the mines from stationary plant compressors.

In the heading holes, cartridges of 1¼- x 8-in. No. 3 Hercomite are used to blast down the rock. The shots are fired so that the holes forming the V go off first and then delayed exploders fire the shots in the rows of holes following on each side of the V. This method breaks out the center and the succeeding shots cause the rock to fall in toward the center. No. 2 Gela-

mite cartridges, 1½ x 8 in., are used to bring down the ceiling. Ceilings present a very smooth appearance as a result of these blasting methods.

Electric shovels are used in all mines with the exception of one Diesel and that is being converted for electric operation. All mines load gasoline trucks with 20-B Bucyrus-Erie shovels. In some of the mines, as at Lilmay and Mullins, the trucks haul the rock up a ramp, approximately 1000 ft. from the portal, and dump into quarry cars drawn by Plymouth gasoline locomotive to the plant site. Cars are then pulled up an incline to the primary crusher. At Russellville trucks haul stone from the shovel direct to the primary crusher while at High Bridge the trucks haul the rock out of the mine and dump it direct to hoppers feeding quarry cars



Map showing location of mines and quarries of the Kentucky Stone Co., with respect to location on railways



Left: Quarry car at High Bridge dumps to the right into primary jaw crusher. Right: Quarry at Mt. Vernon. At the top of the face, to the left, is a blast hole drill in operation and to the right is a steam shovel used for stripping. Below may be seen an electric shovel and steam shovel near the face, and in the foreground a truck is dumping to a quarry car

which are drawn up an incline to the primary crusher. Tyrone has a different set-up. The stone here is mined, loaded into 1½-ton trucks by a 20-B Bucyrus-Erie electric shovel which in turn dump their loads into skips. These skips are raised up a vertical shaft 247 ft. and automatically tripped discharging their contents into a No. 8 Austin gyratory crusher. It is a balanced type hoist, a loaded skip going up while an empty comes down. Mining conditions are somewhat different at the Irvington oolite plant, and will be described under the general description of operations of that unit under a separate heading.

Agricultural limestone at all plants is produced with 3XB Gruendler pulverizers with the exception of Mullins where it is made as a by-product.

Operations at Upton and Mt. Vernon quarries and the commercial stone quarry at Irvington are comparatively simple. Rock formation is in horizontal strata. Drilling is done with Bucyrus-Armstrong blast hole drills, electrically-operated, holes ranging in depth from 70 ft. at Upton to 120 ft. at Mount Vernon. All overburden is removed by power shovels. Rock is loaded on the quarry floor with gas and steam shovels, hauled to the ramp by truck and dumped to quarry cars which are drawn up an incline to the primary crusher hopper in the plant.

#### Tyrone Mine and Plant

Located on the Kentucky River in Anderson county, near Tyrone, Ky., the Tyrone plant is served by the Southern Railroad. It is a mining operation with drilling being done by

Cleveland wagon drills and Sullivan safety stopers. Stone is handled from mine to primary gyratory crusher as previously described.

The product of this crusher is elevated to a 5- x 10-ft. double-deck Kennedy scalping screen, the rejects being returned to a 4-ft. Tel-smith gyrasphere for further reduction. Throughs from the Kennedy scalper are elevated to a 4- x 12-ft., triple-deck Robins and a smaller double-deck Niagara screen for further sizing.

This plant is entirely electrically operated. Air for drilling is furnished by an electrically-driven Ingersoll-Rand compressor of 600 c.f.m. capacity.

Stone crushed at Tyrone is used for railroad ballast and highway material. Plant capacity is 90 tons per hour of 2-in. stone and down. Bin capacity is 600 tons. Lister Gaines is superintendent of this plant.

#### High Bridge

High Bridge plant and mine also is situated on the Kentucky river in Jessamine county, near High Bridge, Ky. It is served by the C. N. O. & T. P. railroad.

Drilling is done with Cleveland wagon drills and Sullivan safety stopers. After blasting, stone is loaded by a Diesel shovel into 1½-ton trucks which dump into a 4-cu. yd. car which is pulled up an incline and the contents discharged directly into a 28- x 36-in. Traylor jaw crusher. The product of this crusher is further reduced by a 10-A Tel-smith crusher, the throughs of which are elevated to a 4- x 12-ft., triple-deck Robins screen and a 4- x 12-ft., double-deck Niagara screen. Rejects from the Robins screen are returned to a No. 2 Tel-smith reduction crusher.



Quarry car at Mt. Vernon dumping to primary crusher, left. Secondary crusher is to the right

Capacity of the plant is 75 tons per hour of 2-in and down. The product is used for railroad ballast and highway construction. Bin capacity is 400 tons. The plant is entirely electrically driven. Lister Gaines also is in charge of this plant.

At High Bridge there is a separate agricultural limestone plant. Screenings and up to 1-in. stone are hauled by truck from plant bins or stockpile and dumped from a ramp to a hopper feeding the agstone pulverizer. Throughs go to the boot of a belt bucket elevator which carries the pulverized material to bins in the concrete silo which has a capacity of 200 tons. A truck driveway beneath the bins makes it convenient for haulers.

## Mullins Mine and Plant

This mining operation is located on Round Stone Creek in Rockcastle county, Kentucky, and is served by the Kentucky division of the L. & N. railroad.

At Mullins, the drilling is done with Sullivan wagon drills and safety stopers. After blasting, stone is loaded by an electric shovel in 1½-ton trucks which dump their contents into 4-ton quarry cars. These cars are hauled by Plymouth locomotives to the foot of the incline serving the crushing and screening plant. Cars drawn up the incline are dumped directly into a 20-in. Superior-McCully crusher. The product of this crusher is elevated by a double-chain Link-Belt bucket elevator to a 5- x 12-ft., triple-deck Simplicity screen. Rejects are returned to a 10-in. Superior-



Exterior of Mullins plant. Steam power plant building to the right, old workings to the left, and new mine is below, to the right, but not shown in the picture

McCully crusher and a 6-in. McCully crusher for further reduction.

Throughs from the 5- x 12-ft. Simplicity screen are sent to a 4- x 12-ft., triple-deck screen for further sizing. All three of these crushers are operated in closed circuit. Plant capacity is 175 tons per hour of 2-in. stone and down.

Power for this operation is obtained from two 150-hp. boilers. Steam from these boilers serves a Corliss engine which drives the crusher plant equipment. Steam from the same source operates a 600 c.f.m. Worthington compressor and a direct-connected Skinner generating set which furnishes current for the shovel, for lights, and for power to operate the

screens. The 2300-volt a.c. current is transmitted by Parkway cable laid in the floor of the tunnel running back into the workings of the mine for a distance of 1500 ft. under ground where transformers convert the current to 440-volts to serve the shovel.

The product of this plant is largely railroad ballast and highway material. Bin capacity is 600 tons. John Williams is superintendent of the plant.

## Russellville Mine and Plant

Located in Logan County, Kentucky, near the city of Russellville and served by the Nashville division of the L. & N. railroad, is the Russellville plant and mine.



Official family of Kentucky Stone Co., taken at the time of the 1943 Kentucky Derby races. The officials attended the races as the guest of President Sam P. Burnam. Top row, left to right: Sam P. Wagers, Service; T. C. Ridge, manager Calcium Carbonate division; Oliver Shumate, checker, Lilmay; John O. Williams, superintendent, Mullins; D. L. Lovens, superintendent, Yellow Rock; W. T. Brooks, auditor; George Wolpert, sales manager; Lee Francis, checker, Yellow Rock. Bottom row, left to right: George Anderson, heading foreman; Roy Cummins, checker, Mt. Vernon; Ed Williams, superintendent, Russellville; Verne C. Morgan, secretary-treasurer; Sam P. Burnam, president; W. T. McMahan, superintendent, Irvington; Asher Cummins, superintendent, Mt. Vernon; and Hollace Goodwin, checker, Irvington. Lister Gaines, western division manager, Tyrone and High Bridge; and Mr. Allen, engineer, did not get in the picture





Above: Pulverizer unit adjacent to agricultural limestone plant.

Left: High Bridge agricultural limestone plant with concrete silos above

Mined stone is loaded by shovel into 2½-ton Mack and White trucks. These trucks deliver their loads directly to a 20-in. Superior-McCully crusher. The product of this crusher is scalped from a 4- x 12-ft., triple-deck Simplicity screen, the rejects being sent to a 4-ft. Symons cone crusher. The crusher and screen are operated in closed circuit. Throughs from the 4- x 12-ft. Simplicity screen are elevated to a 5- x 10-ft., triple-deck Symons and a 4 x 8-ft. triple-deck Symons screen for further sizing. Two 3XB Gruendler pulverizers are operated at this plant for the production of agricultural limestone. The plant is entirely electrically operated. Air for the drills is produced by a Chicago Pneumatic compressor.

Production from this plant is largely used for railroad ballast and highway purposes. Plant capacity is 200 tons per hour of 2-in. stone and down. Bin capacity is 600 tons. Ed Williams is superintendent of this plant.

#### Yellow Rock

The Yellow Rock mine and plant operation is located in Lee county on the Kentucky river, and is served by the Eastern Kentucky division of the L. & N. railroad.

Sullivan wagon drills and safety stopers are used for drilling. Following blasting, stone is loaded by an electric shovel to 1½-ton trucks which deliver their loads to 4-cu. yd. Western dump cars. These cars are hauled to the crushing and screening plant by one 10-ton and one 12-ton Plymouth locomotives. Cars are dumped directly into a 20-in. Superior-McCully crusher.

The product of this crusher is delivered by a double-chain Link-Belt bucket elevator to a 5- x 10-ft., triple-deck Simplicity screen. Rejects from this screen are returned by belt conveyor to a 4-ft. Symons cone crusher. Throughs from the Simplicity screen are delivered to a 4- x 12-ft., double-deck Niagara screen for further sizing. Plant capacity is 150 tons per hour of 2-in. and down stone.

Power for the plant is obtained from three 150-hp. boilers. These boilers furnish steam for a large Skinner engine which drives the entire plant equipment, including a 650 c.f.m. I.R. Imperial type 10 air compressor. Steam from these boilers also furnishes power to a direct-connected Skinner generating set which supplies 440-volt current for operation of the shovel. Steam is also used to drive a smaller d.c. generating set which provides power to operate screen motors.

This plant supplies material for railroad ballast and highway departments. Bin capacity is 600 tons. Agricultural limestone also is produced. D. L. Lovens is superintendent.

#### Lilmay Mine and Plant

The Lilmay plant and mine are located in Hardin county, Kentucky, near Stephensburg, Ky., and the operation is served by the I. C. railroad.

Drilling is done with Ingersoll-Rand wagon drills and Sullivan safety stopers. After blasting, stone is loaded into 1½-ton trucks by an electric shovel which dumps into quarry cars. The cars are hauled by Plymouth locomotives to the foot of

the incline serving the plant. Cars drawn up the incline are dumped into a 7½ Austin crusher. The product of this primary crusher is elevated to a 4- x 18-ft. rotary screen. Rejects from this screen are returned to a 3-ft. Symons cone crusher. The throughs from the rotary screen are put over a 4- x 8-ft., triple-deck Robins screen for further sizing. The plant is entirely electrically driven. Air for the drills is furnished by a 600 c.f.m. Worthington compressor.

Plant capacity is 70 tons an hour of 2-in. stone and down. Bin capacity is about 400 tons. Ernest Blair is superintendent.

#### Quarry Operations

There are three remaining open pit quarry operations, Upton, Irvington, and Mt. Vernon.

#### Upton

Upton quarry is located in Hardin county near the village of Upton, Ky., and is served by the Louisville division of the L. & N. railroad. Drilling is contracted for this quarry. Blast holes 6 in. in diameter are sunk 3 ft. below the floor of the quarry. Holes are spaced 15 ft. apart and 15 ft. back from the face. From 30,000 to 40,000 tons of stone are brought down per shot. Broken stone is loaded by a 19-B Bucyrus-Erie gasoline shovel into 1½-ton trucks. These trucks dump to a quarry car at the foot of the incline which serves the plant. Cars drawn up the incline are dumped into a No. 6 Gates style K crusher. The product of this crusher is delivered to a 4- x 20-ft. rotary jacketed screen. Rejects of this screen are returned to a 6-in. fine reduction McCully crusher. Throughs from this rotary screen are further sized over a 2- x 7-ft. Niagara screen. A 3XB

## MINING

Gruendler pulverizer is operated for the production of agricultural limestone.

Plant capacity is 50 tons per hour of 2-in. stone and down. Bin capacity is 300 tons. Tom Jagers is superintendent.

### Irvington

Irvington quarry is located in Breckenridge county, Kentucky, on the Henderson division of the L. & N. railroad. The face of this quarry, which ranges in height from 40 to 90 ft., is drilled with a Bucyrus-Erie Armstrong blast hole machine. Six-inch holes are sunk 3 ft. below the floor of the quarry. About 30,000 to 40,000 tons of stone are brought down with each shot.

Stone is loaded by a 20-B Bucyrus-Erie gasoline shovel into 1½-ton trucks which discharge their loads directly into a 14-in. McCully crusher. The product of this crusher is elevated to a 4- x 8-ft., triple-deck Symons screen. Rejects from this screen are returned for further reduction to a 3-ft. Teismith gyrasphere crusher. Throughs from the screen are sent to a 3- x 8-ft. Symons screen for sizing.

This entire plant is driven by a D-17000 Caterpillar Diesel engine. The plant capacity is 60 tons per hour of 2-in. stone and down. A 3X Gruendler pulverizer is operated to produce agricultural limestone. Bin capacity is 300 tons. J. L. Alloway is superintendent.

### Mt. Vernon

Mt. Vernon quarry is located near the county seat of Rockcastle county, Kentucky, on the Louisville division of the L. & N. railroad.

Stone is here quarried from an open face pit, ranging in height from 50 to 120 ft. There is at present about 30 acres in the quarry floor. The entire face of the quarry is drilled by an electrically-driven Bucyrus-Erie blasting machine with the holes being sunk 3 ft. below the quarry floor. Holes are 6 in. in diameter, and generally are spaced 20 ft. apart and 16 ft. back from the face. From 40,000 to 60,000 tons of stone are brought down with each shot.

The stone is loaded by a 1-cu. yd. Marion steam shovel into 1½-ton trucks which in turn dump their loads from a ramp into a quarry car which is drawn up the incline serving the plant. The car is dumped into a No. 8 Austin crusher. The product of this crusher is scalped by a 4- x 12-ft. Kennedy rotary screen. Rejects from this screen are returned by a belt conveyor to a 10-in. fine reduction McCully crusher. The two crushers are operated in closed circuit. Throughs from the rotary screen are elevated to a 4- x 12-ft., triple-deck Simplicity screen and a 4- x 10-ft., double-deck Niagara for further sizing.



Group of three gyratory crushers at Mullins, 20-in., 10-in., and 6-in., driven by belt from line shaft

This entire plant is electrically driven. It has a capacity of 125 tons per hour of 1-in. stone and down. Railroad ballast and highway materials constitute the major portion of the production. Bin capacity is 350 tons. Asher Cummins is superintendent.

### Oolite Plant

One of the most interesting of the operations is the oolite mine and plant at Irvington which is entirely separate from the commercial quarry stone plant.

This rock is a soft, high calcium stone which is comparatively free from impurities. Because of its properties it has found a ready market for whitening used in making putty, for plastic industries, and many other purposes.

A ledge 12 ft. thick is mined and the rock loaded by a 10-B Bucyrus-Erie shovel into 1½-ton trucks for hauling to the jaw crusher. The strata of oolite does not follow a horizontal plane but has an irregular inclination, and therefore the mining problem is somewhat more difficult than at the commercial stone mines.

Trucks haul the stone to a Universal jaw crusher set at 1½-in. The discharge from this crusher flows to a 5- x 24-ft. Fuller-Lehigh rotary dryer. From the dryer, the oolite rock is elevated to two bins. Two bins are used so that the oldest and coolest dried rock is available for grinding. Dried stone is chuted to a 24-in. conveyor below the bins which carries it to the boot of a steel bucket elevator which discharges into two steel hoppers superimposed over two 48-in. Fuller-Lehigh mills. There is also an older 42-in. mill supplementing the 48-in. mills. Two Sturtevant air separators, in closed circuit with all three mills, separate out the de-

sired product, the tailings being returned to the mills for further grinding. The air separators can make 20-mesh, 200-mesh, and 325-mesh products simultaneously.

Alongside the oolite plant is a railroad siding for shipping out products. On one side of the track are four bins holding 40, 200, and 325-mesh products. These sizes are taken by gravity from bins and run through a two-bag Bates bagging machine which is on a track so that it may serve any of four bins. All 20-mesh material is moved by screw conveyor to a 50-ton bin on the other side of the track. From this steel bin, the 20-mesh product flows to a two-bag Bates machine. About 85 percent of the production is 20-mesh material, most of which is packed in 50 and 100-lb. bags, but "lawn lime" is put up in 5, 10, and 25-lb. bags. W. C. McMahan is superintendent of the Irvington plant. T. C. Ridge, manager of the Calcium Carbonate division, is in charge of the promotion of the oolite products.

### Geology of Limestone

High Bridge, Tyrone, and Russellville limestones are sedimentary beds of Ordovician period, High Bridge and Lexington series. Mullins and Mt. Vernon are Upper and Middle Mississippian strata. Irvington and Lilmay are Upper Mississippian strata and Yellow Rock is Upper Mississippian, Chester and Merrimac series. These rocks are all hard and durable and have given excellent results when subjected to abrasion and freezing and thawing tests. The oolite rock of course is soft, but it is not sold as a commercial stone but enters into the industrial and chemical stone markets.

Since the reorganization in 1936,  
(Continued on page 91)

# Excavation

## Five Men Operate Well-Designed Plant

**White Gravel Co., Camden, Ohio, excavates material with slackline cableway. Recovers fines with classifier, and uses impact crusher to reduce oversize**

**F**IVE MEN and a well-designed plant are doing an efficient job at the White Gravel Co. operation, just south of the corporate limits of Camden, Ohio. Erected in 1942, the selection of equipment and its final arrangement indicate thoughtful planning for the problems in the years ahead.

The company has been operating a 12-acre deposit since 1928. A deep lake has formed some 60 ft. below ground level. The lake now has an average depth of 25 ft. A 1-cu. yd. Sauerman excavator bucket on a 850-ft. Sauerman slackline cableway, powered with a 60-hp. General Elec-

Excavator bucket on slackline cableway dumping material over grizzly at the top of the plant. Three-compartment bin is shown in foreground

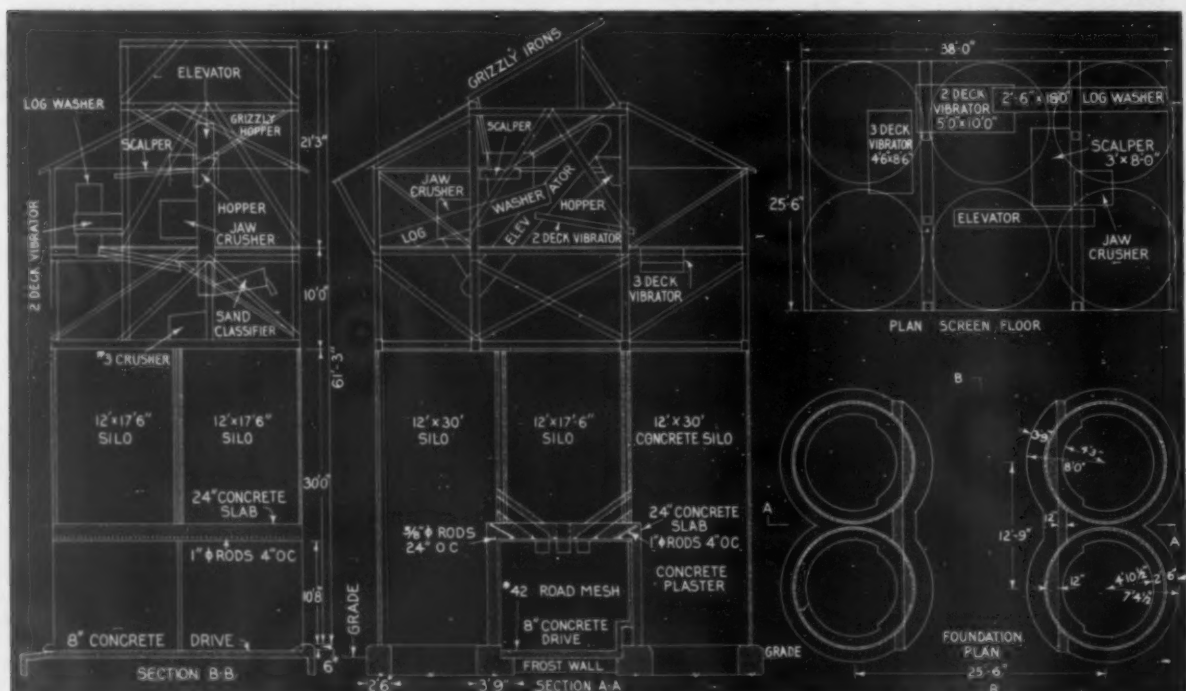


tric motor, lifts the material to a height of 64 ft. to sloped grizzly bars having 9-in. spacings. Throughs pass to the grizzly hopper while the oversize rubble drops to the ground.

A chute leads from the grizzly hopper to a 3- x 8-ft. Cedar Rapids triple-deck scalper screen, driven by a 10-hp. General Electric motor, where material above 1/4-in. and up

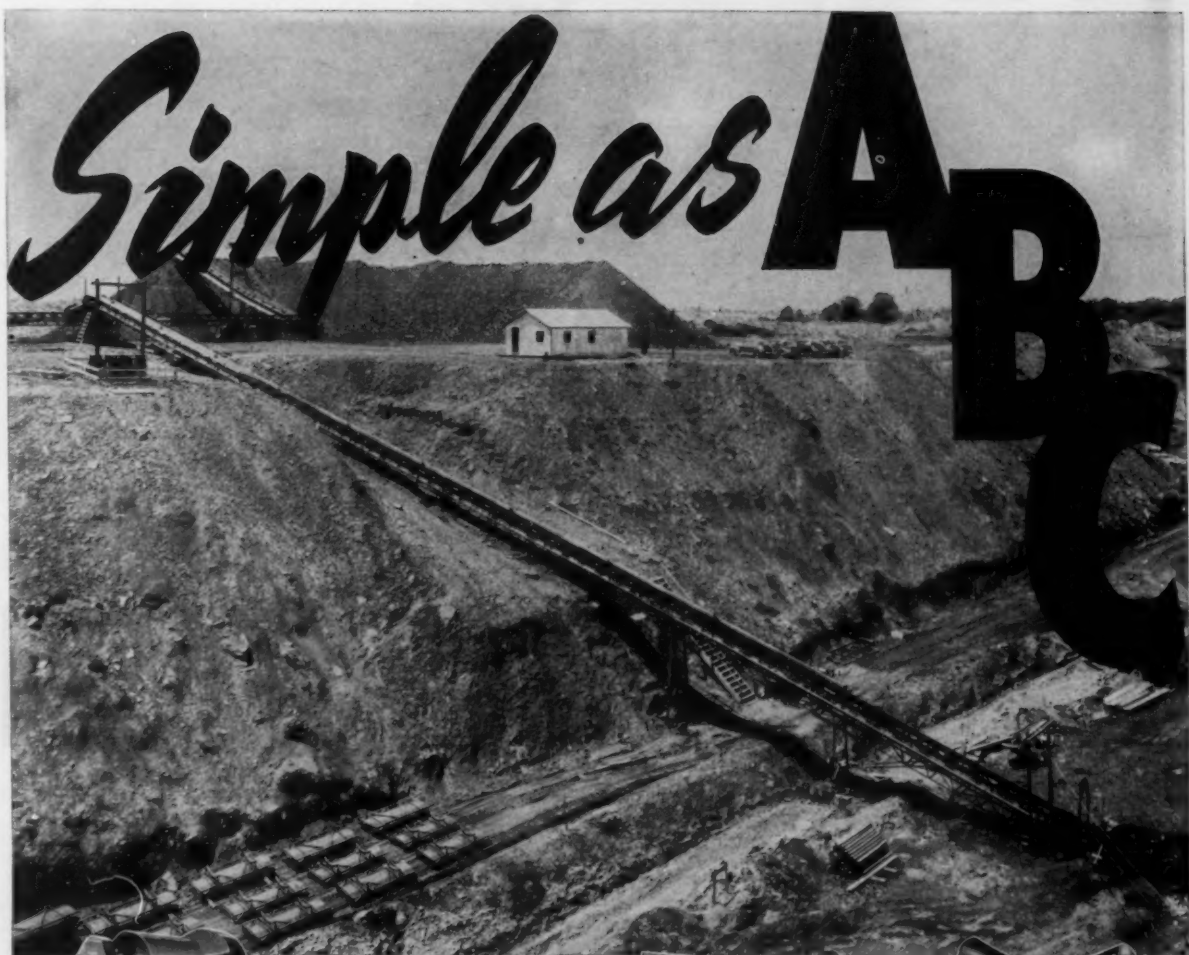
to 2 in. is passed to a 22-ft. Eagle log washer equipped with a 15-hp. General Electric motor. Everything below 1/4-in. goes to an Eagle sand classifier, operated by a 7 1/2-hp. General Electric motor, and the oversize from the scalper moves into a Universal 10- x 36-in. jaw crusher, driven by a 40-hp. General Electric motor.

(Continued on page 59)



Plan and elevation details of sand and gravel washing, screening and crushing plant





**A** variety of B-G terminals are available in a wide range of types, sizes and horsepower to meet the length and width of belt required. Factory assembled and shipped as units ready for bolting to the conveyor frame. Eliminates field assembly of miscellaneous pulleys, bearings, etc. These standardized

units are being used on some of the largest conveying jobs in the world—in processing plants, storing and reclaiming, and underground installations.

**B**-G conveyor frames range from channel to truss type, in depths to meet the span requirements.

Lengthening a conveyor is a matter of adding the required number of sections. Terminal units attach directly to any section facilitating revamping of conveyor system. Standardized units simplify plant design and erection.

**C**arriers and return rollers are of

all-steel construction, jig-welded to insure accuracy of alignment and furnish maximum strength with minimum weight. Available in roller, ball or plain bearings, and as troughing, flat, self-aligning, and special rubber impact carriers. Properly designed carriers standardized to provide uniformity prevent costly belt wear.

There is nothing complicated about using Barber-Greene standardized belt conveyor units. They are pre-engineered and designed for production manufacture. You can custom build your material handling and utilize interchangeable conveyor units. The B-G Conveyor Catalog 76 illustrates and tabulates the units available as standard manufacture. From this list, you select the equipment fitted to your needs. Barber-Greene engineers and mining consultants can help you plan for now and for future expansion.

44-00

**BARBER GREENE**  
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# DOUBLED LOADS HAULED SINCE 1935



ON ONE

## TRUXMORE

WORLD'S BEST 3<sup>RD</sup> AXLE

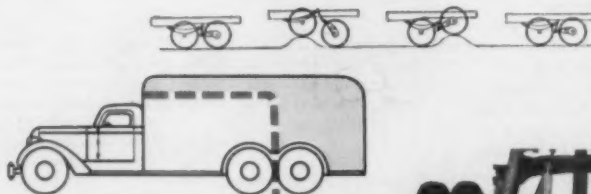
Here is a truck that has paid for itself time and again with extra heavy loads hauled. A TRUXMORE Third Axle accounts for the difference between loads of 4 to 6 tons of concrete block and loads of 9 tons.

Yes, with that TRUXMORE Third Axle the truck now carries nine tons as easily as it did 4 or 6. This performance isn't being had with a new TRUXMORE

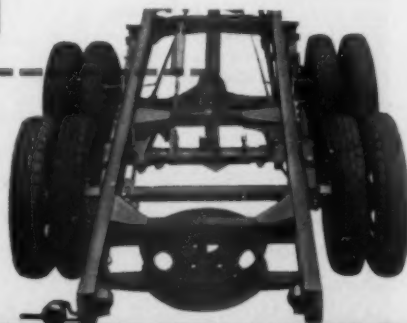
unit either. The one used on this truck has seen the same steady service since 1935, and it is still as good as new. It is one of five used by Domine Builders Supply Co., Inc., Rochester, N. Y. It is typical of how you can double the capacity of your trucks with TRUXMORE—how you can cushion loads carried so wear and tear on trucks is even less than before installing TRUXMORE.

## 10 BIG THINGS TRUXMORE DOES FOR YOU

1. Carries two payloads in one
2. Saves in first cost (up to 40%)
3. Saves on Insurance (up to 50%)
4. Saves fuel costs (up to 20%)
5. Saves tires (50 to 100% longer life)
6. Saves road time (up to 20%)
7. Saves breakage of fragile loads.
8. Saves on license fees
9. Saves on dead weight
10. Saves on maintenance costs

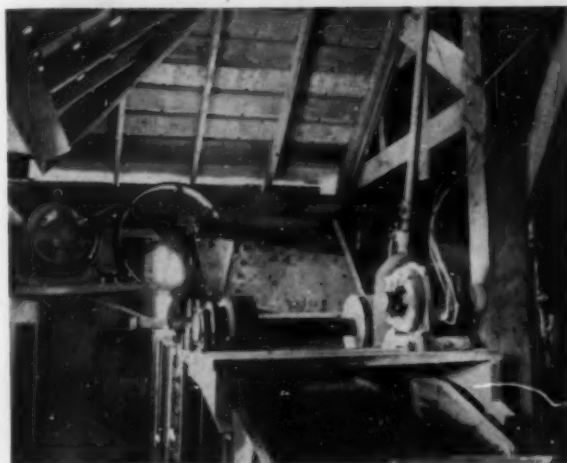


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## EXCAVATION



Left: Upper end of log washer in background and double-deck vibrating screen in foreground. Right: Five men who handle all plant operations

(Continued from page 56)

Material from an Eagle washer is distributed over a 3- x 6-ft. double-deck Diester vibrating screen, equipped with a 3-hp. motor. The first screen deck has a  $\frac{3}{4}$ -in. mesh and the second screen deck a  $\frac{1}{2}$ -in. mesh. Material below  $\frac{1}{2}$ -in. moves onto a triple-deck Diester vibrating screen, with a 3-hp. General Electric motor, for finer classification. Here the material is separated by 7/16-in., 5/32-in., and  $\frac{1}{8}$ -in. screening.

The oversize from this operation passes through a secondary No. 3 Kubit crusher, with a 40-hp. Imperial motor, and is discharged into a Link-Belt bucket elevator powered by a 10-hp. General Electric motor. These 8- x 14-in. buckets discharge onto a 3- x 8-ft. triple-deck Diester vibrating screen having 13/16-in., 7/16-in. and 3/16-in. screen meshes. The various separations go to chutes discharging into the bins. Six Neff & Frye concrete silos, each with a capacity of 80 tons, provide storage.

The operation produces a No. 9, 5/32-in. retained on a 3/16-in. mesh; No. 6, through  $\frac{1}{2}$ -in. retained on  $\frac{1}{4}$ -in. mesh; No. 46, through  $\frac{3}{4}$ -in. retained on  $\frac{1}{4}$ -in. mesh; No. 4, through  $\frac{3}{4}$ -in. retained on  $\frac{1}{2}$ -in. mesh; No. 34, through 2-in. retained on  $\frac{3}{4}$ -in. mesh, together with both fine and coarse sand at the rate of 40 tons an hour. These are Ohio State Highway Commission specifications.

A 1-compartment Blaw-Knox weighing batcher with a capacity of 80 tons of sand is located in the rear of the plant structure. There is also a 3-compartment Blaw-Knox batch bin, 120-ton capacity, on the north side of the plant. These together with a 30-ton yard bin are served by a Northwest gasoline crane having a  $\frac{1}{2}$ -cu. yd. clamshell bucket. A Haiss loader serves trucks from the stockpiles. Truckloading from bins is sim-

plified by having the trucks back into the center of the plant structure where lever-controlled chutes dump directly from the bins. Weighing out is done on a Fairbanks, Morse platform scale. The plant equipment includes a 4-cu. yd. Ford dump truck for utility purposes.

The product is used principally for road and construction work within a 20-mile radius. The Camden Pipe and Tile Co. and Neff & Frye, both in Camden, and manufacturers of concrete products, are on the customer list for aggregates.

The company is owned in partnership by C. E. Gregg, N. O. Gregg and R. E. Ulrich who is also general superintendent. Mr. Ulrich designed the plant and W. O. Jeffers and Son, Xenia, Ohio, were general contractors.



Looking toward other side of plant, showing 80-ton sand bin and batching equipment

### 10 Billion for Post-War

POST-WAR construction projects totaling 41,805 reported to F. W. Dodge Corporation call for an expenditure of over \$9,581,538,000. These projects are all contemplated for the 37 states east of the Rocky Mountains, and it is expected that similar listings for the 11 western states would probably increase the total by some 20 percent. Forty percent of the projects have been reported in the design stage.

Private residential building accounts for 19,606 of the projects at an estimated cost of \$658,846,000, and private non-residential building projects numbering 6,796 have an estimated value of \$861,148,000. Public residential projects number 372 with a total value of \$251,619,000; public non-residential building projects account for 6274 with a total value of \$1,363,765,000.

The largest dollar volume of anticipated expenditures is in heavy engineering work with 8373 public projects and 384 private projects, amounting to \$6,245,959,000 and \$200,201,000, respectively.

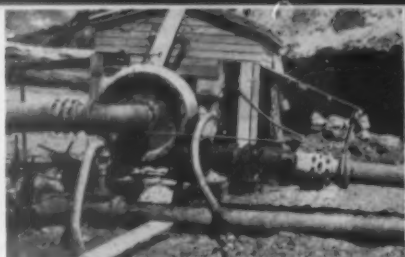
### Panama Cement Mill

IN PANAMA, the president of the Republic has been active in promoting plans for a cement plant. Organization of a \$1,500,000 corporation for this purpose has been announced. Tentative plans have decided upon for a plant in Maria Eugenia, a village in the Chilibre area of Panama. This site is reported to be accessible to hydro-electric power, and to reserves of raw material.

### Expand Block Operations

BIRMINGHAM SLAG Co., Birmingham, Ala., has started to build a very modern concrete block plant at Alabama City, Ala., with W. J. Shaw in charge of construction.





# REPUBLIC RUBBER PRODUCTS TO DO SPECIFIC JOBS

**R**EPUBLIC engineers study service requirements and design mechanical rubber products to do the job. A typical example is in the phosphate industry, where conditions require specific designing for hydraulic mining and refining of pebble phosphate rock.

Republic Suction Hose, to be attached to dredges or to the line from pit to washing plant, is flexible, yet mechanically strong to withstand collapse under vacuum and will not kink from external abuse. Its tube resists the cutting action of solid material in suspension.

Republic Phosphate Flexibles, used to cushion vibration at the pump, are wear-resisting and reinforced internally with heavy wire windings to withstand high pressures and surges.

For washing and recovery operations Republic Conveyor and Elevator Belts are specially designed to handle wet material. Where reagents are present, which are destructive to natural rubber, oil resisting types of belting are furnished. For high temperatures in drying and storage, destructive to standard belts, Republic has developed special Heat Resisting Conveyor and Elevator Belting to handle the hot phosphate.

Processing and refining operations in the Phosphate Industry depend on Republic Flat Transmission Belting, V-Belts, Water Hose for jetting and flushing, Air Hose, Oil Hose, Chute and Launder Lining, Packings and numerous rubber items. All these classes of service have been carefully studied by Republic engineers and for each application a product has been designed for the job.



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# IT PAYS TO KEEP MACHINERY IN PROPER REPAIR

- The tendency in idle times is to economize by omitting necessary repairs to machinery.

- But risking ruination of machinery representing a large investment, for want of a few inexpensive replacement parts, is hardly justified.

- Not only is there the danger of injury to the machine, but a breakdown, when it occurs, usually comes when the machine's capacity is most required.

**Idle periods are an opportune time to overhaul;  
busy periods require the machines to be kept up.**

- AND REMEMBER, when obtaining repair parts, that the manufacturer of the machine for which they are intended has gained experience with many similar machines in other plants—that he is constantly making improvements in those parts based on this experience—that his shop is equipped with tools specifically for the manufacture of such parts—that the parts are usually made to templet, making easy changeability—that many of the parts are patented, and that he is interested in supplying parts that will assist in obtaining the highest efficiency from the machine itself.



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for Cement, Lime, Ores, etc.

# Construction

## Mexico's Cement Production Problems

**Transportation break-downs and fuel shortages have limited cement production in 1944. New cement production capacity will not solve immediate problems**

CONSIDERABLE has been written concerning the tremendous increase in Mexican cement production expected during the year 1944. Various estimates show an 80 percent increase in production for 1944 and a 140 percent increase for 1945 as compared with production during the year 1943; actual production figures for the first half of the year 1944 show these estimates to have been most optimistic combined with a certain amount of wishful thinking.

During the first six months of 1944 none of the existing cement producers in Mexico reached the production obtained during the first six months of 1943, notwithstanding the fact that most of these plants had installed additional kilns, mills and allied equipment with the object of having a substantial increase in output.

A number of unforeseen factors have entered the production picture which have had an adverse effect on maintaining old plant capacities and delaying any increase in capacity of new units installed in the various plants.

One of the main adverse factors consists in the break down of railway transportation facilities in every section of Mexico where cement fac-

tories are located. As a consequence of this no single cement plant has received its normal fuel oil requirements, whereas those factories dependent upon the railways for the haulage of their raw materials have been doubly affected. A second factor adversely affecting production during the period March through June was the shortage of electric power from hydroelectric sources, and such plants as are dependent upon this source of power had their supply restricted during this period by 20 percent and upwards. This came about as a result of the seasonal dry period that prevails in Mexico during the months above mentioned.

The table below contains statistics of cement production during the years 1942 and 1943 and the estimated production of cement for the years 1944 and 1945. This table was formulated by the Mexican Cement Producers Association and was given to the Secretary of National Economy in February 1944.

### Resumé of Producing Companies

Cemento de Mixcoac, S. A.: This company installed a third kiln in late 1943. During the three months'

dry season period in the spring of 1944 its power consumption was restricted by 20 percent. During 1944 to date due to fuel oil and limestone shortage as a result of the break-down in railway transportation, plant has at times been able to operate only one of its three kilns.

Cemento Portland Nacional: This company operates its own diesel power plant and had no power restrictions. During February through April plant was 100 percent shut down due to lack of fuel oil, and has since operated spasmodically due to the continued fuel oil shortage.

Cementos Atoyac, S. A.: This company had a 20 percent power restriction from March through June. Since April its capacity has been restricted due to fuel oil shortage and has operated only two of its four kilns.

Cementos Hidalgo: Has had restricted cement production due to shortage of fuel oil and restriction in cement shipments due to shortage of railway cars. Only operates two of its four kilns.

Cementos Mexicanos, S. A.: Uses gas as fuel and has not been affected by fuel oil shortage, but has had power restrictions. Has been less affected than other plants.

Compañía Cementos Apasco: Has had insufficient power for normal plant operations. Has been shut down due to lack of fuel oil and gypsum due to railway transportation problem. Operates one kiln normally and its second kiln spasmodically.

La Cruz Azul, S. C. L.: Has had power, fuel oil and gypsum shortages which have affected normal operations.

La Tolteca Portland: Has some waste heat power but has experienced power restrictions. Has also been shut down at times due to lack of fuel oil and gypsum.

Cementos Guadalajara, S. A.: Has operated at about half capacity due to limestone and fuel oil shortages.

### Resumé of Companies Projected or Under Construction

La Cruz Azul, S. C. L. Lagunas, Oaxaca: One-kiln plant has been under construction since 1942, and expected to be ready for operations in fall of 1944.

Cementos, S. A. Tlalnepantla, Mexico: Has small one-kiln plant

(Continued on page 92)

PRODUCTION OF CEMENT IN THE MEXICAN REPUBLIC  
(In Metric Tons)

Producing Companies	1942	1943	1944	1945
Cemento de Mixcoac, S.A., Mexico City	141,330	135,178	225,000	270,000
Cemento Portland Nacional, S.A., Hermosillo, Sonora	28,761	24,562	28,800	28,800
Cementos Atoyac, S.A., Puebla, Puebla	14,200	56,587	90,000	90,000
Cementos Hidalgo, Hidalgo Nueva Leon	46,535	39,109	72,000	72,000
Cementos Mexicanos, S.A., Monterrey, Nueva Leon	87,333	85,545	116,000	170,000
Compañía Mexicana de Cemento Portland "Apasco," S.A., Apasco, Mexico	29,666	34,199	75,600	75,600
La Cruz Azul, S.C.L., Jasso, Hidalgo	77,775	79,200	79,200	79,200
La Tolteca, Cia. de Cemento Portland, S.A., Tolteca, Hidalgo	104,805	131,805	144,000	144,000
Cementos Guadalajara, S.A., Guadalajara, Jalisco		11,405	72,000	72,000
Companies Projected or Under Construction				
La Cruz Azul, S.C.L., Lagunas, Oaxaca			27,000	36,000
Cementos, S.A., Tlalnepantla, Mexico			12,600	25,200
Monterrey del Norte, Monterrey, Nueva Leon			48,000	144,000
Cementos del Pacifico, S.A., Mazatlan, Sinaloa			18,000	36,000
Cementos Veracruz, S.A., Orizaba, Veracruz			24,000	72,000
Cementos Anahuac, S.A., Cuernavaca, Morelos			36,000	72,000
Cementos de Yucatan, Merida, Yucatan			13,500	54,000
	560,405	597,590	1,081,700	1,430,800



# MARION

## PROVEN PERFORMANCE

*Will be prepared to go  
to work for you on a  
broader scale than ever  
before when the War Ends*

**AFTER THE WAR IT WILL PAY TO  
MODERNIZE with MARIONS**

Turn to MARION for a sure solution to your  
Postwar Material Handling Problems

**THE MARION STEAM SHOVEL CO.**

Marion, Ohio ★ U. S. A.

# Ready Mix

## Controlling Quality of Concrete

**Goff-Kirby Co., Cleveland, Ohio, installs  
model batching plant in permanent location  
after having served three large war jobs**

**C**ONCRETE CUSTOMERS of the Goff-Kirby Co., Cleveland, Ohio are already receiving advantages from this company's participation in important war construction projects. While the promise of better automobiles and other manufactured products, brought about by the impetus of the war on research and technology, is still something that lies in the future for the majority of consumers, users of concrete in the Cleveland area are now benefiting from improved batching methods adapted by the Goff-Kirby Co., to produce concrete to meet rigid specifications on war projects for the armed forces. This company was one of the first in the country to apply its services, equipment, and know-how, to the problems of supplying quality ready mixed concrete to contractors on important war projects located outside

\*Chief engineer, Scientific Concrete Service Corporation.

**By W. R. MILLER\***

the operating radius of existing commercial plants.

Early in 1941 this company began supplying the contractors on the Plum Brook Ordnance project near Sandusky, Ohio, with ready mixed concrete batched through a completely equipped modern plant erected near the center of the job site. This project, involving some 70,000 cu. yds. of concrete was completed early in 1942. When the prime contractor on this project was selected by the armed forces to build a similar project near Point Pleasant, W. Va., the Goff-Kirby Co., was awarded the contract to furnish the concrete for this job also. The Point Pleasant project involved some 60,000 cu. yds. of concrete, and much of the same equipment, including the concrete plant, was also used for this job. When

this project was completed early in 1943, the entire plant was then moved to the Parsel Army Air Force Supply Depot near Shelby, Ohio where over 57,000 cu. yds. of concrete were produced through this plant in 90 days.

The entire plant was moved for the fourth and last time in the fall of 1943, and after being thoroughly reconditioned was erected in its present location at Goff-Kirby's main yard in Cleveland to replace a smaller plant which had become inadequate to handle the increased business of the company at that location.

The Goff-Kirby Co., has a history dating back to 1884 when its retail coal business was started. Ready mixed concrete was added to its line in 1935, and it is now one of the largest producers of ready mixed concrete in the State. This concern, always on the lookout for improved methods, adapted the (SC)<sup>2</sup> method

(Continued on page 66)



Batching plant for ready mixed concrete with line-up of transit mixer equipment

Net balance, \$9,396,484.748.

## East Pepperell Plant to Get Army-Navy "E" Award

Bemis Bro. Bag Co. Presentation to Follow Parade and Elaborate Ceremony

## Bemis Bag Co., Pepperell, Gets E Award on Thursday

Presentation ceremony for the Army-Navy "E" to the East Pepperell plant of Bemis Bro. Bag Co. held at 2

## Pepperell Plant Wins High Praise

Army-Navy to Take Part in Bemis "E" Ceremonies

PEPPERELL—The Bemis Bag Co. will receive the Army-Navy "E" Award

## Gas Resistant Sacks Win 'E' For an East Pepperell Firm

War Activities of New England

achievement in manufacture of gas resistant sacks for the Chemical Warfare Service of the United States won the Army-Navy "E" Award for the East Pepperell plant of the Bemis Bro. Bag Co. The award was presented to the plant by the Army-Navy "E" Award Committee, but now they plan to send him a special "citation" signed by the War Relocation Authority.

## East Pepperell Plant Honored With Army-Navy "E" Award

Bemis Bro. Bag Co., Wins Tribute From Services for Production Achievement

By Barbara A. Browne  
PEPPERELL—Impressions of the presentation of the Army-Navy "E" award to Bemis Brothers Bag Co. brought crowds of people to the plant.

## Bemis Bro. Firm to Get Army "E" for Fine Service

East Pepperell, Mass., June 23—Awarding of the coveted Army-Navy "E" to the Bemis Bro. Bag Co. has just been announced by the Secretary of War, R.S. Parsons in Washington.

Brigadier General Alvin C. Graves, assistant chief of the Chemical Warfare Service for Field Operations, will journey from Washington to be the principal speaker at the ceremony scheduled for Thursday.

Grateful...  
Proud...  
Humble...

EMPLOYEES of the Bemis Bro. Bag Co. at East Pepperell, Mass., whose war production work has earned the prized Army-Navy "E" are deeply grateful for the opportunity to help their country and the men fighting for it.

They are proud that their work has been considered worthy of this special recognition by our Army and Navy.

They are sincerely humble in the realization that their contribution is, even so, only "a drop in the bucket" compared to that of the fighting men whose efforts they are supporting.

And the Bemis Company is proud of these employees... and grateful and humble with them.

# BEMIS BAGS



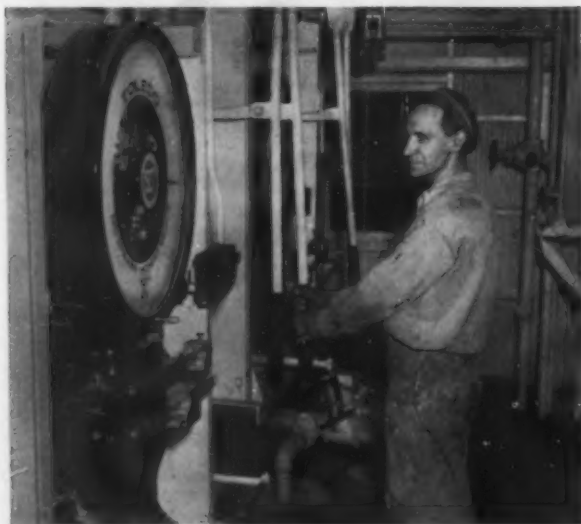
BEMIS BRO. BAG CO.

Pepperell, Mass. • East Pepperell, Mass. • Mobile, Ala. • San Francisco, Calif. • Wilmington, Calif. • St. Helens, Ore.

Albany, N.Y. • Boston • Buffalo • Butte • Chicago • Denver • Detroit • Kansas City • Los Angeles • Louisville • Minneapolis • Milwaukee • New Orleans • New York City • Norfolk • Omaha • Philadelphia • St. Louis • St. Paul • Seattle • Tacoma • Portland, Ore. • Portland, Me. • Portland, N.H. • Portland, Vt. • Portland, Conn. • Portland, Ind. • Portland, Mo. • Portland, Ky. • Portland, Tenn. • Portland, Ark. • Portland, La. • Portland, Miss. • Portland, Ala. • Portland, Ga. • Portland, Fla. • Portland, Tex. • Portland, Okla. • Portland, N.M. • Portland, Colo. • Portland, Wyo. • Portland, Mont. • Portland, Idaho • Portland, Nev. • Portland, Utah • Portland, Ariz. • Portland, Calif. • Portland, Wash. • Portland, Ore. • Portland, Ind. • Portland, Mo. • Portland, Ky. • Portland, Tenn. • Portland, Ark. • Portland, La. • Portland, Miss. • Portland, Ala. • Portland, Ga. • Portland, Fla. • Portland, Tex. • Portland, Okla. • Portland, N.M. • Portland, Colo. • Portland, Wyo. • Portland, Mont. • Portland, Idaho • Portland, Nev. • Portland, Utah • Portland, Ariz. • Portland, Calif. • Portland, Wash. • Portland, Ore.

BETTER BAGS SINCE 1858





To the left: Batching operation showing cement scale, left, and compensator scale, right. To the right: Determining moisture content of aggregates with moisture meter scale. Recorders on the wall, left, make permanent record of every ingredient entering each batch

of concrete control to this plant at the start of the Point Pleasant project. Other improvements to the bin and batching methods were made at Shelby and later in its present location so that today it is probably as efficient a concrete plant as can be found.

### Concrete Control System

Control of the concrete begins with the aggregates. A well graded Lake Erie sand with an average fineness modulus of 3.00 is used as fine aggregate. The coarse aggregate ordinarily used are limestone or slag. Several sizes of slag as well as both masons and silica sands are also kept in stock. All aggregates are carefully stockpiled so as to keep segregation to a minimum. A Diesel-powered railroad crane equipped with a 1½ cu. yd. clamshell bucket transfers the aggregates into one of two ground level hoppers which feed a Barber-Greene inclined belt conveyor. This carries them to the top of the bin where a selective spout controlled from below direct them into the proper compartments. Electric Bin-indicators shows when each aggregate or cement compartment is full.

The bin itself is a Butler four-compartment steel bin with two 350-bbl. overhead cement storage compartments and four 70-ton overhead aggregate storage compartments. This bin is equipped to handle bulk cement delivered by truck, hopper bottom railroad car, or in L.C.L. containers. On previous setups an inclosed bucket elevator was used to elevate the cement into the bin. As it is now set up the elevator constitutes a standby method in case something should happen to the L.C.L. air activated method of piping the ce-

ment directly into the hopper. This company was instrumental in pioneering the air activated system and prefers it to any other method for handling cement. On the batching floor of the bin are located the weigh hoppers, the batching and control equipment, and the laboratory for testing the aggregates and concrete.

The control methods and equipment merit considerable attention since in the final analysis much of the value of the careful control exercised throughout the plant would be lost unless the batching procedure corresponded in accuracy to the accuracy of the mix designs and adjustment. The (SC)<sup>2</sup> control method used was developed by the Scientific Concrete Service Corp., and includes specially designed Toledo scales. Moisture tests of the aggregates are ordinarily made every half hour although at times when the moisture content of the aggregates fluctuated

considerably tests have been made from practically every batch. The tests are made on the (SC)<sup>2</sup> moisture meter. This scale operates on the specific gravity—water displacement principle and shows the percent of free moisture carried by any aggregate directly and quickly. The weighman usually makes the determination himself as it can be made in less than a minute. The moisture meter is also used for testing specific gravity, for sieve analysis, and for unit weight determinations.

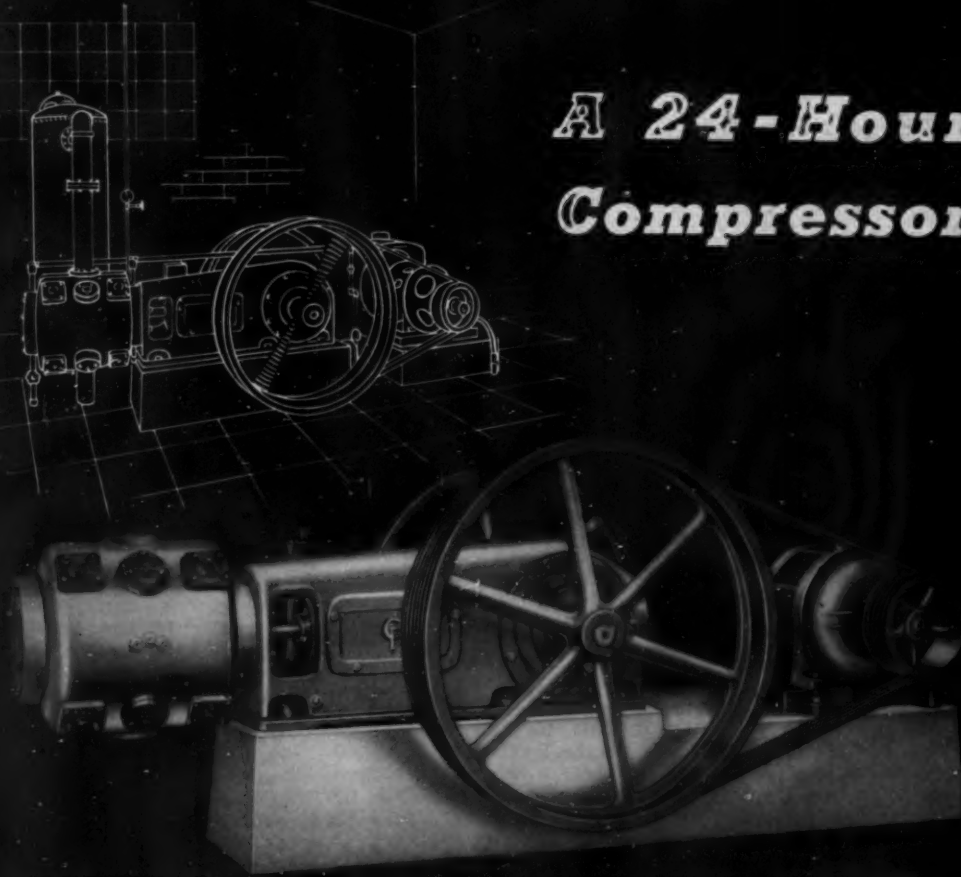
The cement is fed from the overhead bins through a vane feeder and a 12-in. diameter screw into the cement weigh hopper. A 5-hp. two-speed electric motor operates the feeder and screw. This hopper is connected to a Toledo (SC)<sup>2</sup> full dial scale having a 3000-lb. capacity. Double mercury magnetic switches in the scale actuate relays to slow the feeder and screw when the weight

(Continued on page 93)



High discharge type mixer equipment is used exclusively

## A 24-Hour Compressor



**with high efficiency... low maintenance**

**T**HE CP Type T Compressor is a "wheel horse" for economical, continuous performance... keeps working away, year after year, with minimum maintenance. It is of the horizontal, single-stage, double-acting, water-cooled type, arranged for belt, direct-connected motor or steam drive. Simplate valves, liberal water jackets, one-piece

trouble-free crosshead, double-row tapered roller main bearings are a few of the features responsible for its superior performance. Type T Compressors are available in sizes from 15 to 125 hp, in single-stage design for pressures up to 150 pounds, and in multi-stage units for pressures up to 5,000 pounds. Write for Bulletin 728.

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AIR COMPRESSORS  
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AVIATION ACCESSORIES

## Calcining Behavior Tests of Dolomite, Magnesite, and Calcite

By VICTOR J. AZBE\*

WHEN APPLIED TO LIME BURNING and to the production of hydrate, calcium carbonate ( $\text{CaCO}_3$ ) as well as the oxide and hydrate derived from it, are fairly well known, so their behavior in these processes is reasonably predictable. This seems less so in the case of magnesite ( $\text{MgCO}_3$ ) and its derivatives and still less in the case of the double carbonate, dolomite ( $\text{CaCO}_3\cdot\text{MgCO}_3$ ). Referring particularly to their dissociation points and dissociation rates, some generally accepted data are clearly wrong.

As neither kiln heat requirements nor kiln efficiency can be calculated without this knowledge, nor kiln be designed intelligently, an effort was made to study the calcining behavior of these carbonates. In this work the aim was not to establish absolutely the dissociation point of these carbonates, but rather more to determine whether the currently accepted data are correct, and if so whether under all conditions.

It was generally assumed that these carbonates, when in an atmosphere of  $\text{CO}_2$  at the standard pressure of one atmosphere, would start and continue dissociating at the following temperatures:

	Dissociation Temp., deg. F.	Authority
1. Calcium carbonate..	1698	Johnston
2. Magnesium carbonate of magnesite .....	1393	Mitchell
3. Magnesium carbonate of dolomite .....	1535	Mitchell
4. Calcium carbonate of dolomite .....	1648	

Fig. 1 presents the dissociation curves for various temperatures and  $\text{CO}_2$  pressures. There is no reason to doubt the accuracy of Johnston's for calcium carbonate, but those for magnesite and dolomite by Mitchell are, as will be proven here, completely wrong. Unfortunately, almost all text books on the subject present

these curves and sometimes emphasize their reliability. The seldom used magnesia dissociation curve established by Marc and Simek is, however, as far as we know, correct.

### Temperatures of Dissociation

It is strange the great difference there is in the temperature of dissociation of  $\text{MgCO}_3$  at the  $\text{CO}_2$  pressure of one atmosphere, as determined by different investigators. They are given below and they range from 503 deg. C. for Marc and Simek, which is the lowest, to 756 deg. C. for Mitchell, which is the highest. Knibbs claims that Mitchell's is the most reliable. We claim that Marc and Simek are correct.

Dissociation temperature of  $\text{MgCO}_3$  at  $\text{CO}_2$  pressure of one atmosphere:

	Deg. C.	Deg. F.
LeChatelier .....	680	1257
Hedvall .....	546	1014
Friedrich .....	570-600	1058-1112
Marc & Simek .....	503	936
Mitchell .....	756	1360

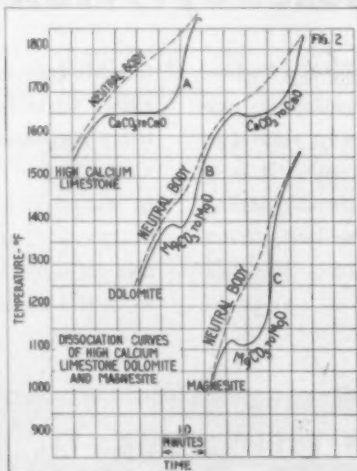


Fig. 2: Shows the results and indicates the breaks in the smooth continuity of the heating curves of magnesite, dolomite, and high calcium limestone at which the heat absorbing reaction was taking place

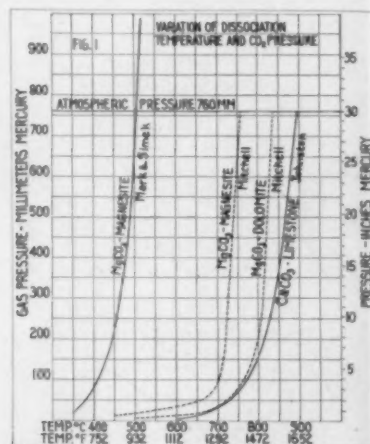


Fig. 1: Dissociation curves for various temperatures and  $\text{CO}_2$  pressures

In the case of dolomite, confusion was even greater and there were inaccurate claims made as to the dissociation of dolomite. Errors resulted because, while temperatures and pressures may have been determined correctly, the time taken into consideration was short, and the rate of dissociation, which is dependent on time, was not taken into account. In the early period of our investigation we also committed this error so we can appreciate the reason for the confusion. The whole procedure is interesting and instructive, so we are presenting results of both our series of tests, including those which are inaccurate with those that are correct.

### Test Specimens

The specimens used for the first series of tests were California magnesite, high calcium oolitic limestone from the Ste. Genevieve, Mo., district and dolomite from the Gibsonburg-Woodville, Ohio, district. These specimens represent the purest and some of the most important deposits of their kind in this country. In addition, single calcite crystals were also tried for check purposes, as well as specimens from other high calcium and dolomite deposits.

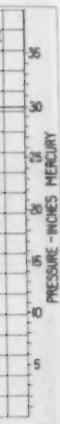
Samples of each were sawed and ground into small pellets. A hole was drilled into the center of each and thermocouple junction was embedded in the hole, with terminals leading to a potentiometer indicator or recorder. Similar procedure was followed in the case of mineral of equal size which, by test, did not have a transformation point within the temperature range of these tests.

One sample of the carbonate and one of the non-reactive mineral was placed into an electric furnace, through which  $\text{CO}_2$  of the desired strength was passing, and the cur-

(Continued on page 70)

\*Consulting engineer.





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## WIDE, EASY LOADING BODY...

If you have idle construction equipment, make it available for home front use, where it is urgently needed. Register all your idle equipment with the local office of the War Production Board.



Wide body top opening permits full, heaping loads, assures easy and quick spotting of shovel dipper. Heaping loads every trip increase production. Short wheel base and three shuttle speeds make it easy to maneuver in tight spots, close to the loading unit. That, combined with the wide body top opening, cuts shovel swing time for more dipper passes per hour. Seconds are saved with every move... you get more loads per hour with Koehring Dumpers.

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# HEAVY-DUTY CONSTRUCTION EQUIPMENT

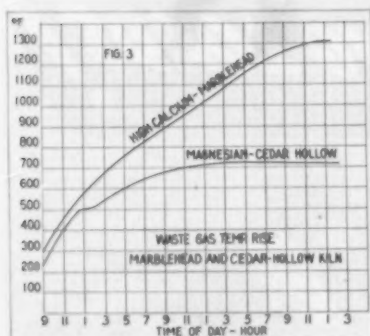


Fig. 3: Curves showing that kilns calcining dolomitic rock had waste gas temperatures 550 deg. lower than for similarly operated high calcium kilns

rent was turned on for a fast heating rate. Fig. 2 shows the results and indicates the breaks in the smooth continuity of the heating curves of magnesite, dolomite, and high calcium limestone, at which the heat absorbing reaction was taking place.

The neutral mineral heating curve is also plotted for contrast. There is no reaction so there is no deflection, except for a slight smooth deviation caused by the reduction of the rate of furnace heating brought on by the heat absorbing reaction of the sample being tested.

The results of these tests, of which many were made for check purposes, were in error. They were assumed as being sufficiently correct for practical purposes. The results showed that magnesium carbonate of magnesite dissociated at 1100 deg. F., magnesium carbonate of dolomite at 1380 deg. F., and calcium carbonate of either dolomite or high calcium stone at 1648 deg. F. Mitchell's results, even at this early point, were abandoned as incorrect.

We labored under this illusion for a considerable length of time, but gradually a suspicion developed that these figures were not only inaccurate but that they were too high by a considerable amount, particularly for dolomite. It was then decided that Mitchell's figures were completely useless.

One of the first observations leading to doubt of our own laboratory determined figures was that when fairly similarly constructed and fired kilns had their charges brought to the same state of preheating, the kilns calcining dolomitic rock persistently had waste gas temperatures very close to 550 deg. F. lower than that for similarly operated high calcium kilns (Fig. 3). A lower temperature for one than the other was to be expected, but it should have been approximately the difference between A and B of Fig. 2, or only about 250 deg. F., and not 550 deg. F. This latter figure could have been antici-

pated only in the difference between A and C, that is, if magnesia of dolomite had dissociated as magnesite would.

It was all quite puzzling and it was considered important to solve the puzzle. A search for the discrepancy was instituted, which incidentally proved very interesting and profitable almost immediately.

It is very readily discernible, if stone is heated over 1300 deg. F., or to a temperature below 1100 deg. F. At 1300 deg. F., or over, there will be a pronounced redness, but below 1100 deg. F., there will be a very dull red or blackness. It was noted that the top of the stone in a lime kiln, when no stone was added through the night, was frequently red in the morning in the case of high calcium

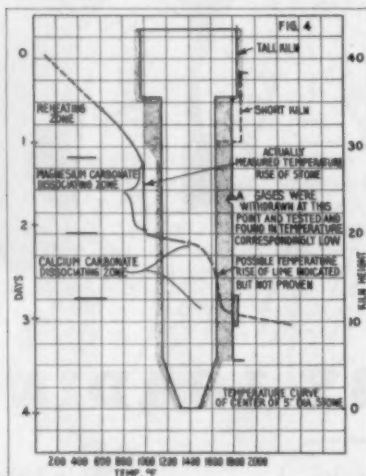


Fig. 4: Temperature curve of center of 5-in. diameter stone, kiln tapped at point "A"

stone, but never so in the case of dolomite, except when there was secondary combustion of gases at the kiln top, or when the charging of stone was delayed so long that magnesium carbonate was all dissociated. Then the kiln became a high calcium kiln and the top heated up. If the initial dissociation temperature of dolomite was actually that assumed, the top of the stone under these conditions would regularly have been red.

### Field Tests

Next, some thirty dolomite calcining kilns were inspected through gas sampling holes leading into the magnesia zones of the kiln and in none of these was there any pronounced redness prevailing at this point, indicating at what low temperature the magnesium carbonate dissociated.

As a further check, a kiln was tapped only 13 ft. over the entrance point of combustible gases (Point A, Fig. 4) and the gases were withdrawn with a suction blower at high speed. The temperature was found to be

below 1000 deg. F., again indicating the low dissociation point of MgO in dolomite.

It was then decided to try and obtain the temperature history of a descending lump of limestone, of normal kiln size, while passing with the rest of the charge down through the kiln. A hole was drilled into a 5-in. piece of stone and a thermocouple junction firmly embedded. The thermocouple was a coiled wire 40 ft. long so it would stand considerable stretch without breaking and was connected to a Leeds & Northrup recording potentiometer.

The results are shown in Fig. 4. According to commonly accepted data, the stone should have progressively heated to 1300 deg. F., and then remained at a stationary temperature until the magnesium carbonate portion was dissociated. But actually there was a heating to only about 980 deg. F., after which the temperature remained practically constant. There was only a 20 deg. F. rise in 20 hrs during which period the kiln was drawn five times. The sample was moved on and re-arranged this often for a total distance of 8 ft.

The sample passed completely through the magnesium zone and entered the calcium zone, where at the temperature of 1400 deg. F. the thermocouple which was embedded to a depth of 20 ft. in the stone broke. The sample was observed passing down the kiln for over two days, giving invaluable information, and although the thermocouple finally broke, still allowed for reconstruction of its temperature history through the entire kiln. It was a most unusual test since no thermo-

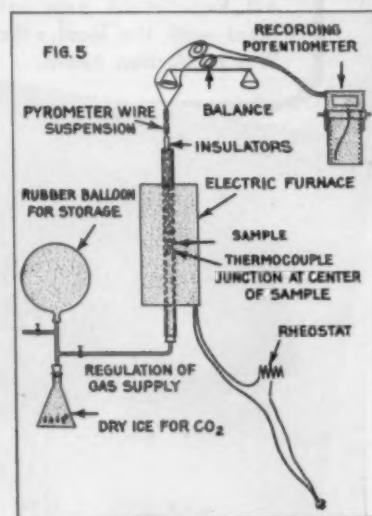


Fig. 5: Special apparatus for continuous determination of temperature, simultaneous weighing, while calcining in test furnace

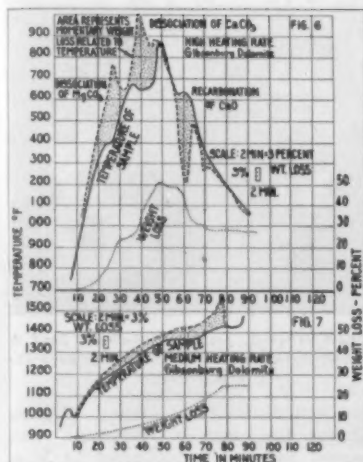


Fig. 6: Results of calcination tests of Ohio dolomite, showing rate of dissociation. Fig. 7: Tests results at a slower rate of calcination

couple wire could have withstood the strain any further at the much higher temperature of the calcium carbonate dissociating zone.

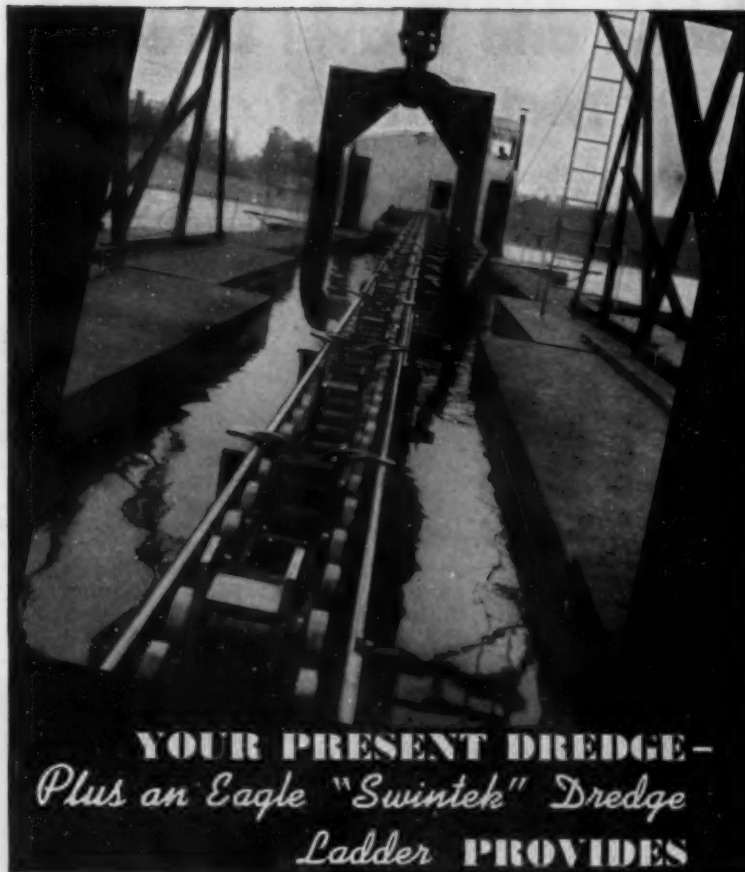
This again checked all of the previous field observations but it by no means explained why the dissociation point obtained in the laboratory was so much higher. It was decided that the answer could only be obtained back in the laboratory. So a special apparatus was rigged up for continuous determination of temperature simultaneously with the specimen weight while the specimen was calcining in the furnace (Fig. 5). The arrangement proved very satisfactory as every temperature and weight change could be noted immediately and plotted against elapsed time.

Through all the tests, the furnace atmosphere was maintained at 100 percent concentration under one atmosphere pressure which, of course, would give a higher dissociation temperature than would prevail in a kiln where  $\text{CO}_2$  concentration is ordinarily around 30 percent. But even in a kiln, a  $\text{CO}_2$  concentration higher than 30 percent would prevail in the stone internally. The concentration and the pressure can only be deducted from the internal temperature obtained.

Fig. 6 gives the results of the first test with Ohio dolomite, which was one of rapid heating, but not as rapid as in the case of tests represented by Fig. 2. Thirty minutes elapsed from the time sample was cold until all  $\text{MgCO}_3$  was dissociated, which was very fast compared with later tests, when the time elapsed ranged from 80 to 1700 minutes. The temperature curve shows two breaks, one for  $\text{MgCO}_3$ , at 1380 deg. F., and the other for  $\text{CaCO}_3$ , at 1650 deg. F. closely conforming to those for the dolomite curve of Fig. 2.

The chart aims to show total accumulative weight loss and momen-

(Continued on page 98)



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- (3) Working in hard cemented conglomerate
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# Sand and Gravel Directors Meet in Chicago

**Post-war problems, government regulations and specifications for ballast and fine aggregates were topics for discussion**

**R**OBERT MITCHELL, president of the National Sand and Gravel Association, opened the semi-annual meeting of the Board of Directors, August 16 in Chicago, by urging members to work hard in the promotion of postwar public works. He suggested that producers become active in their local Chambers of Commerce and work closely with public works officials in order that adequate construction programs be ready for the transition period from war to peace. He also mentioned industry's obligations to returning war veterans

and, in concluding, complimented the executive officers of the Association for their continued fine work.

In presenting his report on finances, executive secretary V. P. Ahearn complimented the individual efforts of Robert Mitchell and others from the Far West in making California the Association's leading membership State in point of number of members and tonnage. Texas is the second leading state in membership. The Association now has the biggest membership in its history. Mr. Ahearn announced the recent death



Robert Mitchell, president, National Sand & Gravel Association, left, and Frank Renwick, first president

of Henry Battjes, Grand Rapids Gravel Co., and a resolution was passed to send condolences to Mrs. Battjes.

Plans are going ahead to hold the annual convention at the New Yorker Hotel, New York, N. Y., January 23-25, 1945, as scheduled, in order to permit members who also produce ready-mixed concrete to attend the convention of the National Ready Mixed Concrete Association.

## Ballast Specifications

Stanton Walker, engineering director, had prepared an informal letter on the subject of railroad ballast which was passed around for discussion, as a sort of preview of material to be included in a factual booklet on gravel ballast that he is going to prepare.

The letter was of an unbiased nature but covered subjects such as the fundamental characteristics for high quality railroad ballast, some significant figures on quantities of all types of ballast used and considerable discussion on types of ballasts, durability and hardness, stability, drainage, the effects of types of ballast on ties and rails and the relative cost of the various types.

According to tables compiled by Mr. Walker, and credited to the U. S. Bureau of Mines, the railroads used 167 million tons of ballast for the period 1938 through 1943, with a plant value of 83 million dollars. Gravel represented 52 percent of the tonnage and 37 percent of the value. All ballast represented 13.6 percent of the tonnage and 8.6 percent of the value of all coarse aggregates. In the case of gravel, ballast was 16.8 percent of the commercial gravel tonnage and 9.5 percent of the value. For stone, the tonnage was 10.2 percent and the value 7.4 percent. The figures for slag were 21.3 percent and 15.6 percent, respectively. The year 1938 had been selected as the starting year for these studies since this is the first year for which statistics for slag are available.

## Fine Aggregate Specifications

Stanton Walker led a discussion on the trends in specifications for

(Continued on page 74)



Semi-annual Board of Directors meeting of National Sand and Gravel Association at luncheon. Left to right: Stephen Stepanian, president National Ready Mixed Concrete Association; Sam Madden, president of the National Association of State Highway Officials, guest speaker; Robert Mitchell, president, National Sand and Gravel Association, and Frank Renwick, first president and honored guest



Informal group at semi-annual directors' meeting, National Ready Mixed Concrete Association. Left to right: Stephen Stepanian, H. C. Peters, and H. F. Thomson, standing. Seated are V. P. Ahearn, Stanton Walker, and E. J. Numan. Report of this meeting appears on another page in this issue

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1 Butler water batcher 200 gals. capacity, beam-type scale, complete with 400 gal. surge tank and valves, manual or automatic operation.

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7—1942 Model Smiths — High discharge type. These mixers were used only 6 months.

Also 6 — 1938 Model Smiths — High discharge type. 3 mounted on 1938 Autocars, 2 on Macks and 1 on White truck. All single axle drive in good condition, with good rubber.



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## Sand and Gravel Meeting

(Continued from page 72)

fine aggregates and their effects on methods of production. The definite trend in specifications toward larger proportions of 50- and 100-mesh fines presents a serious production problem and the subject was brought up for the purpose of developing information on how such fine aggregates are, or should be produced.

Mr. Walker summarized new developments in specification writing to emphasize how prevalent these types of specifications will become. He mentioned the new specification of the War Department covering civilian works construction, which re-

quires 12 to 30 percent of the fine aggregates through 50-mesh and  $3\frac{1}{2}$  to 10 percent minus 100-mesh. He called attention to revisions in the A.A.S.H.O. specifications which provide for a minimum of 10 percent minus 50-mesh and 2 percent through 100-mesh except for less stringent qualifications for a limited number of States. A.S.T.M. desires the same minimum requirements for 50-mesh and 100-mesh.

A survey has been made by Mr. Walker of State Highway specifications for fine aggregate. Two or three States have minus 100-mesh requirements and some eight or ten require 10 percent or more through 50-mesh. All these current specifica-



"Bud" Spratton, Denver, attentively listens

tions were written before 1942 so, in Mr. Walker's opinion, most of them are due for revision. He suspects that nearly all will specify a minimum of 10 percent 50-mesh and that many will require 2 or 3 percent passing 100-mesh in the near future.

He called attention to the fact that the Ohio State Highway Department now specifies a minimum of 15 percent fine aggregate minus 50-mesh. To emphasize the seriousness of the problem of producing one or two more percent of extreme fines, Mr. Walker cited a recent attempt to change specifications in the State of Illinois. It was proposed that present requirements of 5 to 25 percent minus 50-mesh and 0 to 5 percent minus 100-mesh be changed to 10 to 30 percent and 2 to 10 percent, respectively.

If the suggested changes toward more fines had been adopted (they were not), only 25 percent of the producers in the State would have been able to meet the specification and only 50 percent, including that 25 percent could have changed their operations to produce a product that would pass.

In the discussion that followed, the use of roll crushers and ball mills to produce more fines from pea gravel and coarse sand were discussed as well as the possibility of blending fines from outside sources to the run of plant fine aggregate. Mr. Walker believes that extreme fines logically should be an admixture to be blended, in some cases, with normal fine aggregate deficient in 50- and 100-mesh fines.

The pressure for higher proportions of fines evolved from government experience in building dams, in Mr. Walker's opinion, because of the low cement factors obtainable on those projects. In reply to a question as to the influence of air-entraining cements, Mr. Walker's opinion was that such cements should make it unnecessary to have so much of the fines in fine aggregate but any interruption of the trend would be evolutionary.

### Government Regulations

Executive secretary V. P. Ahern discussed, from the viewpoint of the



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sand and gravel industries, the various rules and regulations governing industry's operations that he interpreted at the Board of Director's meeting of the National Ready Mixed Concrete Association the day before (also reported in this issue). The two industries being different, there were different interpretations, of course, on some of the regulations covered in his review.

On the matter of price controls, an industry advisory committee has been appointed to submit a formal recommendation to O.P.A. for the improvement in methods of obtaining price relief, he said. Mr. Ahearn believes that it looks favorable for the granting of price relief to the industry later in the year. He mentioned that all sand and gravel producers in the Los Angeles area had been granted a 10 percent price increase as the result of the combined efforts of five companies representing 75 percent of the production in that area. They submitted balance sheets, profit and loss statements and a complete breakdown of operating costs in detail to support their appeal for a price increase. The fact that they proved the industry to be of public service was an important consideration.

It was mentioned that producers in the Memphis, Tenn., area and in Miami, Fla., also secured price relief. It was pointed out that if a company is losing money on one commodity while making a profit on others, price relief is not precluded on the commodity sustaining a loss. A resolution was passed that the industry request removal of M.P.R. applied to its products.

#### Labor Relations

Mr. Ahearn said that in many cases there have been attempts on the part of unions to impose contractors' wage rates on the sand and gravel industry and he cautioned producers not to agree to an appointment of a referee if there is disagreement on the matter of contracts with unions.

The problem recently came up in Kansas City, Mo., but wage increases were denied by a tripartite board appointed to settle the case. If the attempt to have contractors' wage scales imposed on the sand and gravel producers had been successful it would have amounted to an increase of from 73 cents an hour to 90 cents. Account was taken of the fact that contractors' employees average only three days of work a week as compared to full work weeks in sand and gravel plants, in arriving at a decision in this case.

In discussing the Wage and Hour law, Mr. Ahearn said that its provisions do not apply unless products of the industry move outside State lines. He cautioned producers of railroad ballast and engine sand that they must determine whether those products are shipped in interstate

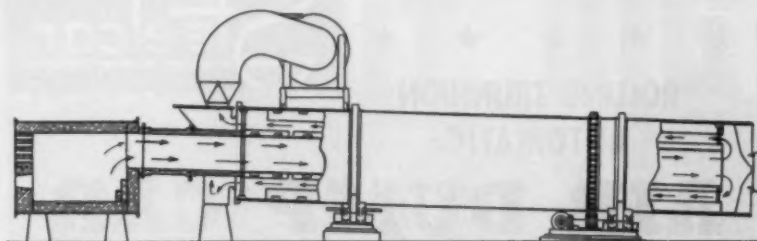
commerce, for, if they are, the provisions of the law are binding for employees engaged in processing those products. Penalties for failure to comply are staggering, he said. Mention was made of a concern that had to pay a bill for \$400,000 back wages for failure to comply.

Mr. Ahearn believes that draft boards have been very considerate and fair to industry and that the industry has gotten along reasonably well insofar as manpower is concerned. The industry is exempt from renegotiation and has not been seriously handicapped for operating supplies and maintenance parts and equipment with the exception of small parts for trucks and heavy

duty tires. President Mitchell mentioned that the Navy had loaned his company tires for use on certain construction projects.

The owner-driver problem is one that Mr. Ahearn cautioned the industry to familiarize itself with. He urged producers to check the status of all drivers to determine whether the 3 percent Federal transportation tax applies or whether social security payments must be paid. The point he emphasized is that one or the other must be paid.

Frank Renwick, president of the Chicago Gravel Co. and first president of the National Sand and Gravel Association was an honored guest at a luncheon for the Board of Di-



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rectors and guests, and Sam Hadden, president of A.A.S.H.O., spoke informally on the Federal Aid Highway Bill.

Mr. Hadden outlined the Bill and the new formula for apportioning the funds of 500 million dollars annually for the first three years after the war. He mentioned that several of the Eastern States have failed to go along with the majority, since they believe they are entitled to more of the funds than the new method of apportioning them provides. As Mr. Hadden pointed out, the important thing is to get the Bill through and the funds into work rather than complain about its distribution. Then at-

tempts can be made to have additional funds appropriated as they are needed.

The registration was as follows:

#### Registration

V. P. Ahearn, National Sand & Gravel Association, Washington, D. C.  
 Theo. Aulmann, Eagle Iron Works, Des Moines, Iowa.  
 Fred F. Bartel, St. Joe, Mo.  
 J. Fennell Berger, John A. Roebling's Sons Co., Trenton, N. J.  
 Q. W. Best, Consolidated Rock Products Co., Los Angeles, Calif.  
 W. A. Bilas, Dravo Corporation, Pittsburgh, Penn.  
 E. W. Boynton, Northern Gravel Co., Muscatine, Iowa.  
 H. P. Caldwell, Ohio River Sand Co., Louisville, Ky.

Claude L. Clark, Ohio Sand and Gravel Association, Columbus, Ohio.

Otto S. Conrades, St. Louis Material & Supply Co., St. Louis, Mo.

R. N. Coolidge, Cumberland River Sand Co., Nashville, Tenn.

H. S. Davison, J. K. Davison & Bro., Pittsburgh, Penn.

Joseph Dixey, Transit-Mix Concrete Corporation, New York, N. Y.

R. C. Fletcher, Flint Crushed Gravel Co., Des Moines, Iowa.

Alexander Foster, Jr., Warner Co., Philadelphia, Penn.

D. D. Guilfoill, Sauerman Brothers, Inc., Chicago, Ill.

S. W. Hadden, president, American Association of State Highway Officials, Indianapolis, Ind.

Hal H. Hale, secretary, American Association of State Highway Officials, Washington, D. C.

Mrs. M. M. Himmeler, National Sand & Gravel Association, Washington, D. C.

Walter F. Jahncke, Flint Sand and Gravel Co., New Orleans, La.

V. O. Johnston, Lincoln Sand and Gravel Co., Lincoln, Ill.

C. L. Luker, McGrath Sand and Gravel Co., Lincoln, Ill.

Daniel J. Miller, Portland Sand and Gravel Co., Portland, Penn.

Robert Mitchell, Consolidated Rock Products Co., Los Angeles, Calif.

M. A. Neville, Western Indiana Gravel Co., Lafayette, Ind.

Bror Nordberg, Rock Products, Chicago, Ill.

E. J. Nunan, The Buffalo Slag Co., Buffalo, N. Y.

H. F. G. Pelsue, Metropolitan Sand and Gravel Corp., Port Washington, N. Y.

H. C. Peters, The T. L. Smith Co., Milwaukee, Wis.

Stanley A. Phillips, Pit and Quarry, Chicago, Ill.

T. E. Popplewell, Fort Worth Sand and Gravel Co., Fort Worth, Texas.

Robert J. Potts, Potts-Moore Gravel Co., Waco, Texas.

J. P. Eyre Price, Wyoming Sand and Stone Co., Scranton, Penn.

John Prince, Stewart Sand and Material Co., Kansas City, Mo.

George W. Renwick, Chicago Gravel Co., Chicago, Ill.

F. W. Renwick, Chicago Gravel Co., Chicago, Ill.

Nathan C. Rockwood, Rock Products, Chicago, Ill.

Walter W. Ropers, McGrath Sand and Gravel Co., Lincoln, Ill.

John Sankey, Chicago Gravel Co., Chicago, Ill.

Joseph Scheinen, James A. Norton, Inc., New York, N. Y.

A. R. Shiely, J. L. Shiely Co., St. Paul, Minn.

C. W. Shirey, Waterloo, Iowa.

Frank P. Spratlen, Jr., Spratlen-MacDougall, Inc., Denver, Colo.

Stephen Stepanian, The Arrow Sand and Gravel Co., Columbus, Ohio.

E. Guy Sutton, Mattoon, Ill.

W. E. Trauffer, Pit and Quarry, Chicago, Ill.

Stanton Walker, National Sand and Gravel Association, Washington, D. C.

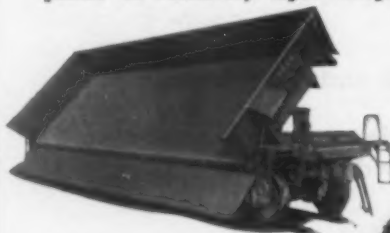
R. E. Weaver, Lincoln Sand and Gravel Co., Lincoln, Ill.

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## READY MIXED CONCRETE DIRECTORS HOLD MEETING

**S**EMI-ANNUAL MEETINGS of the Boards of Directors of both the National Ready Mixed Concrete Association and the National Sand and Gravel Association were held in Chicago, August 15 and 16, respectively, to dispose of business matters and for discussion of wartime regulations and technical problems. Both meetings were well attended, for Board meetings, and Executive Secretary V. P. Ahearn and Engineering Director Stanton Walker both did their usual splendid jobs of conducting the principal discussions. This report is concerned with the ready-mixed concrete meeting; the sand and gravel meeting is reported elsewhere in this issue.

STEPHEN S. STEPANIAN, vice-president of the Arrow Sand and Gravel Co., Columbus, Ohio, and president of the National Ready Mixed Concrete Association, presided at the all day Board meeting of the National Ready Mixed Concrete Association.

In his statement opening the session, Mr. Stepanian introduced Robert Mitchell, president of the National Sand and Gravel Association, whose company, Consolidated Rock Products Co. of Los Angeles, Calif., produces both materials. Mr. Mitchell invited all in attendance to the National Sand and Gravel Association meeting the following day.

Mr. Stepanian briefly outlined the principal activities and accomplishments of the Association in behalf of its membership and expressed great enthusiasm for the Association's accomplishment in having the 20-cent per barrel increase in cement prices recently granted in certain Northeastern states passed along to producers of ready-mixed concrete. As he expressed it, the saving effected for the industry is actually enough in dollars and cents to pay for operating the Association for years to come. In summarizing some of the activities, he mentioned the new booklet "Control of Quality of Ready Mixed Concrete," the purchase of new laboratory equipment for research and the cooperation of the Association with the A. C. I. and

### Discuss war-time regulations and new technical problems

A. S. T. M. in matters of mutual interest.

In his concluding remarks, Mr. Stepanian mentioned that plans are going ahead to hold the annual convention at the New Yorker Hotel, New York, N. Y., January 24-26, 1945, as originally scheduled. The general feeling was that business is not to blame for the heavy burden on the railroads and that this industry has

some very real post-war problems to justify discussion in annual session. All were agreed that the plan instituted last year, of having meeting dates which overlap the dates for the National Sand and Gravel Association on one day, was very successful and should be repeated as now scheduled.

V. P. AHEARN presented the best financial report for the Association

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IN DIGGING  
POSITION )

( ALL THE BUCKET  
WEIGHT IS ON  
THE TEETH )

( BITES IN AT THE  
FIRST PULL OF  
THE LOAD LINE )



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**PAGE**

*Automatic* DRAGLINE BUCKETS



A. L. Shiely, to the left, and Alexander Foster, Jr., to the right



since its establishment. The membership now includes 182 active member companies and 30 associate members, representing an increase of 75 members since 1943. Mr. Ahearn expressed his sincere appreciation to Robert Mitchell and other far western producers for their good work in increasing west coast membership.

A limited number of copies of the new association manual on recommended practices for "Control of Quality of Ready Mixed Concrete" were available for distribution and the committee responsible for its preparation was highly complimented for a job well done. There followed considerable discussion as to how it

might be utilized to increase membership and be distributed to purchasers of concrete. It was felt that, for the present, the booklet be used for the purpose for which it was originally prepared—to serve as a guide to improve the quality of concrete.

#### Mixer Standards

H. C. PETERS, T. L. Smith Co., chairman of the newly-formed Truck Mixer Standards Bureau, discussed the proposed new standards for mixers drawn up a short time before the board meeting, which are up for vote subject to certain minor changes upon recommendation of the Association special mixer committee.

The standards provide that after June 30, 1945, no new equipment will be recognized unless it conforms to the new standards for sizes. Rotating drums will be manufactured in four sizes according to mixing capacities in cubic yards. They will be 2, 3, 4½ and 5½-cu. yd., corresponding to 3, 4¼, 6⅞ and 7¾-cu. yd. agitating capacities, respectively. Mixing capacities for open top mixers will be 1¼- and 1¾-cu. yd., corresponding to 1¾- and 2¼-cu. yd., respectively as agitators. No intermediate sizes will be considered standard but smaller or larger mixers may be manufactured to conform, in increments of not less than one cubic yard smaller or larger than the smallest and largest established standards. Capacities will average about 78 percent of actual drum volumes, which will be certified. No attempt is to be made to out-mode existing equipment, which will be governed by existing standards. V. P. Ahearn is secretary of the Bureau.

#### Technical Problems

STANTON WALKER, in his discussion of air-entraining cements, said that problems of control of air entrainment and loss of strength in concrete are well on the road to solution and he predicted that eventually all concrete will be made from air-entraining cements because of its advantages in the elimination of bleeding and segregation, etc. Mr. Walker theorized a bit on the relation of alkalis in cements to the air-entraining agents.

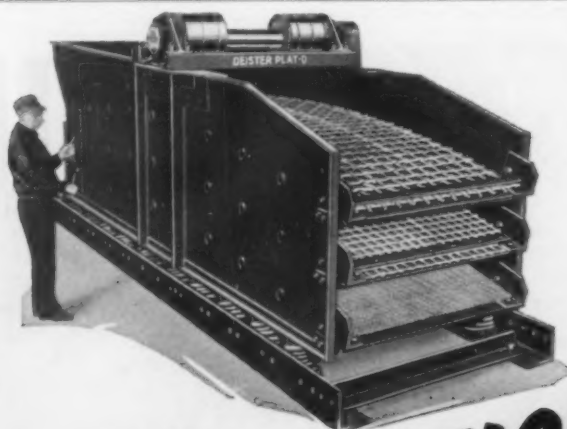
In the discussion of the Association research program, mention was made of the arrangement for establishing a foundation at the University of Maryland. One of the projects to be undertaken will be a study of the durability of concretes made from various cements. In his discussion of research, Mr. Walker passed out a chart showing the relation of ready-mixed concrete volume sold to barrels of cement sold. The industry has grown to the point where a cubic yard of ready-mixed concrete is sold for every eight barrels of cement sold. In 1930, it was one cubic yard for every 30 barrels.

#### Laws and Regulations

V. P. AHEARN discussed the rules and regulations under which the industry must try to operate, emphasizing points that needed clarification in regard to National War Labor Board procedures, price controls, War Manpower Commission Regulations, priority procedures, renegotiation, Order L-41, Executive Order 9240, the Federal Transportation Tax, the enforcement methods of the Wage and Hour Division and the attitude of Unions toward the industry.

Mr. Ahearn emphasized that the ready-mixed concrete industry does not come under the Wage Adjustment

(Continued on page 96)



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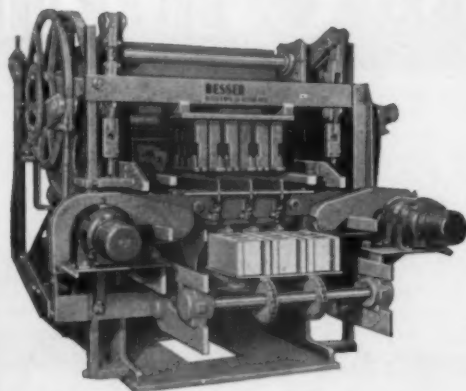
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• Typical example of good under-cover storage practice for concrete block at a large southern plant

S

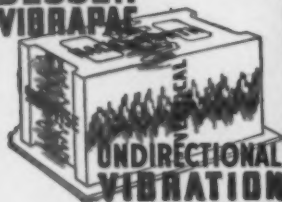
# Concrete Masonry Units For Greater Flexibility



Besser Super Automatic Plain Pallet Vibrapac. Capacity 600 8" x 8" x 16" per hour made 3 at a time on one plain pallet. Smaller units made in larger multiples on the same pallets.

Many of the most outstanding modern housing projects, designed for better, economical living, have been constructed with Besser Vibrapac concrete masonry units. Before the war Concrete Masonry was used in many large scale housing developments. The Government has used Concrete Masonry in a large proportion of war building construction. In addition to its many other qualities, Concrete Masonry has unlimited flexibility for easily eliminating monotony of design which formerly was hard to overcome in small home groups.

**BESSER  
VIBRAPAC**



## Important Patent Notice

Licensed under the Gellman basic vibration patents.

Undirectional vibration licensed under Flann patents.

The Vibrapac combines vibration with exclusive patented Besser Plain Pallet principle.

## BESSER MANUFACTURING CO.

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Alpena, Mich.

Complete Equipment for Concrete  
Products Plants

THE SAVING IN PALLET COST WILL PAY FOR  
A BESSER VIBRAPAC PLAIN PALLET STRIPPER



## Freyssinet Process of Pipe Manufacture

**Prestressed, reinforced concrete pressure pipe for water supply made by unusual methods and equipment**

By M. W. LOVING\*

A PROMINENT American structural engineer and concrete technologist on a visit to Paris, France, made the following statement in a letter dated July 2, 1936, to one of his associates in this country:

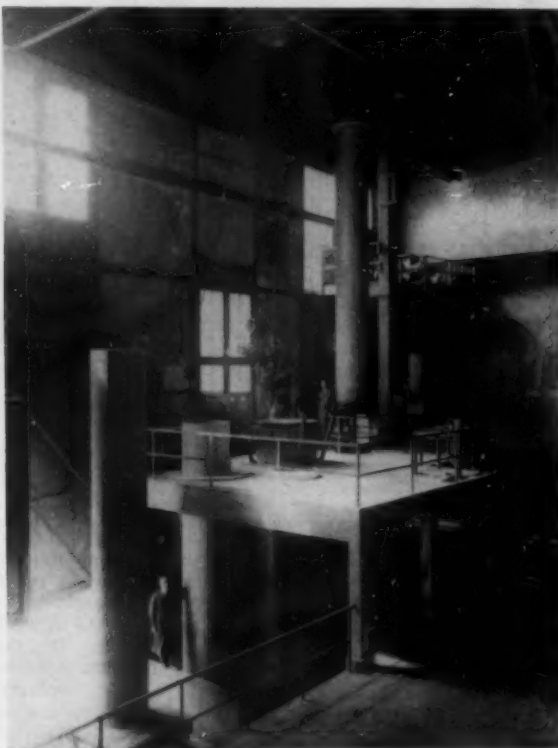
"The biggest event so far has been the three hours at Freyssinet's place of business. Here we met him and his associates. He has a contract in Algiers, North Africa, for the manufacture of reinforced concrete pressure pipe. The pipe are manufactured complete in 3.5 hours and tested to two times designed pressure within 8 hours after molding. Ordinary portland cement is used. The concrete is vibrated, then compressed, then expanded (by internal pressure), then heated. In 3.5 hours the pipe was removed from the mold by a process that would wreck any ordinary pipe.

"The whole arrangement, apparatus, etc., form the most ingenious device or series of devices which I have ever seen in any language. The details have been worked out with a master hand to a perfection I have never seen in a concrete plant. Nothing has been omitted. The steel is prestressed (and accurately) to the desired degree. We actually at 5 o'clock hammered (ourselves) on pipe made at noon today that sounded like concrete months old."

In May, 1937, Comte Raoul de Lubersac visited Chicago and discussed with me and others the proposition of introducing M. Freyssinet's process in this country. Comte de Lubersac, I was reliably informed, was a Director of the Bank of France and was representing Entreprises Campeon Bernard, Travaux Publics, 5, Rue Beaujon, Paris, 80. He gave me a prospectus including pictures and drawings which reveals

\*Consulting engineer.

Fig. 1: Manufacture of prestressed, reinforced concrete pipe in Paris, France. Pipe are 31.5 in. in diameter and 19.68 ft. in length



for the first time, to our knowledge, the details of how reinforced concrete pressure pipe, reinforced concrete piles and other prestressed concrete structures were fabricated. This article is based on that document, prepared by M. Freyssinet and dated May 3, 1937.

### Description of Pipe

We believe that concrete pipe manufacturers, engineers and others interested in new and outstanding developments will find this description of real interest because it shows what can be done, mechanically, to produce concrete, made with standard portland cement, of extraordinary strength, density and impermeability in a short period of time. Comte de Lubersac said his company had produced reinforced concrete pressure pipe for the Algiers, North Africa, contract previously mentioned and from what he told me and the details set up in the prospectus, the following sizes of pipe were required for this improvement:

Internal Dia.	Cm.	Inches	Shell Thickness		Length	
			Cm.	Inches	Meter	Ft.
80	31.5	5	1.97	6	19.68	
120	47.24	7	2.44	6	19.68	
140	55.13	8	3.15	6	19.68	

The pipe were designed to sustain internal hydrostatic pressures of 3 to 5 Kgs./sq. cm. or 40 to 70 p.s.i. (static head 92 to 161 ft.).

Since the pipe are fabricated vertically and in long lengths to minimize the number of joints, when the pipe are used to construct a pipe line, the reader should carefully study Fig. 1 which is a view of a unit for the manufacture of pipe of 80 cm. in diameter and 6 meters in length (internal diameter 31.5 in. and 19.68 ft. in length). This picture should be studied, together with Fig. 7, page 83.

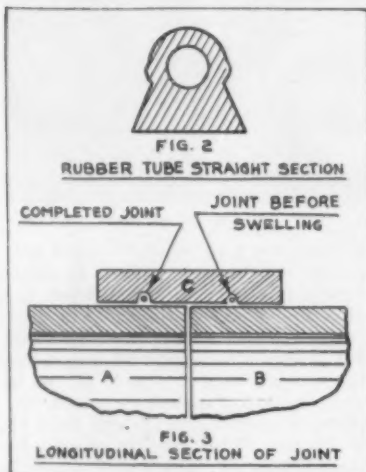
In the original drawing (Fig. 7) all of the directions and details of procedure are set up in French which had to be translated. We believe the reader can follow the procedure by careful study of both Fig. 1 and Fig. 7, together with the procedure presented hereinafter.

The shell thickness of the pipe is determined by a formula in which the thickness in centimeters is equal to the diameter in centimeters, divided by 20, plus 1 centimeter. In other words, pipe of 80 cm. in diameter has a shell thickness of 5 cm. (1.97 in.).

Because the molds are covered with sheets of rustless steel, the inner wall or core is perfectly smooth with a few narrow corrugations which do not interfere with the hydraulic capacity of the pipe line. The outer walls show narrow facets or sectors and the cross-section has the shape of a regular polygon, the number of sides of which changes according to



Fig. 5: Completed branch pipe and manhole in prestressed, reinforced concrete pipe



Figs. 2 and 3: Details of concrete pipe joint assembly



Fig. 4: Plate for branch pipe before welding the flange

the diameter. The reinforcement assembly is made with high tension steel rods, the yield point of which is raised by cold drawing to 80 Kgs./sq. mm. (113,600 p.s.i.) in a special machine.

The circumferential reinforcing members are spirally wound on a special machine and the pitch or spacing of this steel is regulated according to the working pressures to which the pipe line will be subjected. While the pipe is being fabricated, tension is induced in the circumferential members by enlarging the diameter of the mold which is filled with highly compressed concrete and kept so until hardening. When the compression in the mold is released, the tension of the steel compresses the concrete.

The longitudinal steel reinforcement consists of straight steel rods on the ends of which are provided welded lugs to enable the bars to be gripped by jacks, and to be stretched by a suitable contrivance placed inside the mold until the pressure is released from the mold. Whenever this pressure is released the concrete is compressed longitudinally.

In order to avoid all possible deformations when the circumferential members are placed, they are linked to a certain number of longitudinal bars by means of staples electrically welded to the latter by a special process which avoids lowering of the yield point of the steel.

The concrete is made with a high content of standard portland cement mixed with fine aggregate of good quality and carefully graded. The largest size of aggregate is about 10 mm. (.39 in.) for pipes with a shell thickness of 5 cm. (1.97 in.). Slightly larger sizes of aggregate may be used for greater shell thicknesses. In order to obtain maximum strength, density

and impermeability, according to M. Freyssinet, the proportion of fine aggregates is much greater than that used in ordinary concrete (in France).

## Joint Assembly

The joint assembly is shown in Figs. 2 and 3 and consists of a prestressed concrete collar, presumably of the same thickness as the pipe and 0.38 meters (17 in.) in length. Two special hollow rubber gaskets are set in the groove as shown. The outer surface at the ends of each pipe are ground just after fabrication to provide a smooth surface. The annular space between the inner surface of the collar and outer surface of pipe ends is about  $\frac{1}{8}$  in. This indicates the precision to which the concrete is finished. When the collars are placed on the ends of the pipe in the trench the cores in the rubber gaskets are filled with "brauthite," a synthetic resin similar to Bakelite, under pressures of about 50 Kgs./sq. cm. (710 p.s.i.), which hardens in about 3 hours. M. Freyssinet says that special portland cement mortar, presumably made with high-early strength cement may be used for the same purpose.

In the prospectus the procedure of injecting the resin or cement mortar into the rubber core within the collar is not described, but it is assumed that holes are provided through the collars and access provided to the core of the rubber gasket for this purpose. Thus, by expanding the rubber gasket the joint assembly provides a bottle-tight installation. M. Freyssinet says that rubber gaskets have been used for making joints in concrete, cast iron, steel and other pipe lines for more than 50 years. (The same applies in this country, and the standard Dresser coupling used for jointing steel pipe is an example. In the absence of light and air, rubber is not oxidized and has an infinite life expectancy for use in water lines.)

The joints provide for expansion and contraction due to volume change of the concrete when the water conveyed varies considerably in temperature with the seasons, and M. Freyssinet says that a pipe line constructed with it may be built on straight lines, and with the small annular space provided in the collar, the pipe lines may be laid on curves with a radius of 230 meters (752 ft.).

Lateral distribution from the mains is provided by utilizing steel plates on which are welded reinforcing rods to be used instead of the circumferential members for the full length of the plate. This plate is set during the fabrication of the reinforcement assembly by means of a special device provided on the machine that fabricates the reinforcement assembly, which is then placed in the mold.

## CONCRETE PIPE

Tension is induced in the longitudinal bars and they are deviated on both sides of the plate hole, and the pipe is then cast. Pictures of these specials are shown in Figs. 4, 5 and 6.

A removable core, suspended by cables, constitutes the inside mold for the pipe. On its upper section very powerful vibrators (about 20 hp.) are mounted which vibrate at 2000 to 4000 cycles per minute with an amplitude of .04 in. The core consists of either a forged or welded steel tube with a rubber jacket, the latter protected by thin, stainless steel sheets, overlapping one another, which are stretched longitudinally by heavy screws at each end of the core.

By introducing water under high pressure between the steel core and the rubber jacket, it is possible to enlarge the diameter of the core assembly. These sheets, being stretched tightly between the two ends of the core, prevent localized bulging of the rubber jacket under hydrostatic pressure and produce perfect cylinders.

The external part of the mold is stationary and consists of a collar bearing on a ring hung elastically to a very stable platform. Inside this collar is a rubber jacket protected by a series of wooden staves. Just as in the core assembly, it is possible to force water between the outer collar and the rubber jacket; by this means the diameter, limited by the wooden staves, can be reduced or increased.

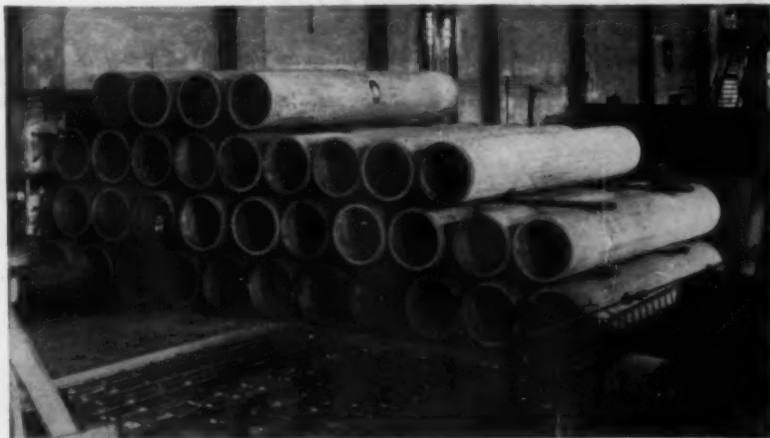


Fig. 6: Completed pipes of 0.80 meter diameter. Note plates for branch pipe at the center of the first pipe in upper row

The outer form of the pipe consists of a series of I-beams bearing upon these wooden staves and with their lower parts resting on the suspended ring. The I-beams are adjusted by means of spacers to provide a true circle.

The staves serve two purposes:

(1) They constitute a form capable of following the variation in diameter of the wooden staves. The slotted openings between the adjacent flanges, which are closed by rubber strips, allow escape of excess

water from the concrete when compressed.

(2) The steel I-beams provide the required strength for holding the longitudinal steel reinforcement in tension until the concrete hardens.

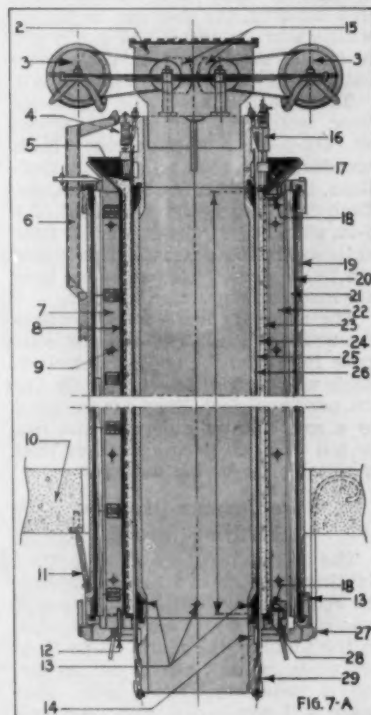
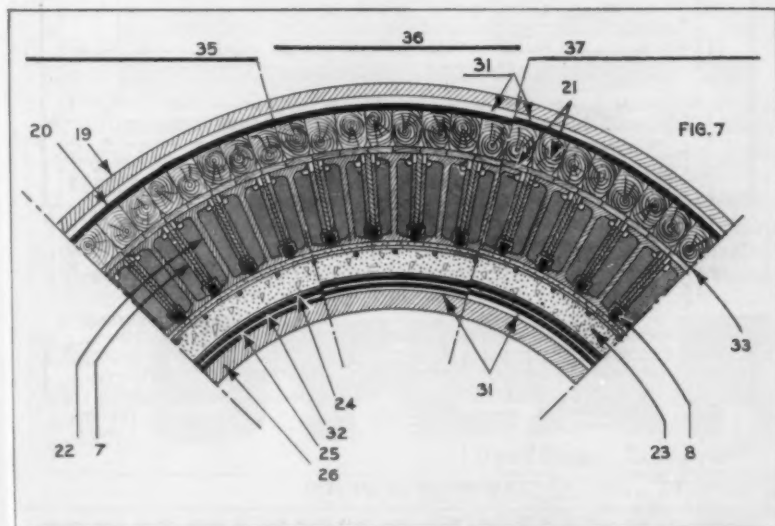
### Steps in Manufacture

The drawings shown in Fig. 7 give a better idea of the features above explained and indicate the various operations in casting a pipe with this form assembly. These stages can be summed up into three main ones:

**1st Stage—(Operations 1 to 5).** Inducing pressure in the outer jacket in order to tighten the staves and obtain the smallest possible diameter;

(Continued on page 86)

Figs. 7 and 7-A: Showing Freyssinet's concrete pipe machine in cross section (7) and longitudinal section (7-A). (1) Longitudinal section of a form; (2) drawing of vibrator; (3) motor of vibrator; (4) spring hanger for upper form end; (5) tremie for filling form; (6) centralizer for central mandrel; (7) intermediary elements between staves; (8) rubber in channel iron between staves; (9) orifice for steam circulation; (10) working floor; (11) hanger bolt; (12) steam inlet; (13) inlet for water under pressure; (14) air inlet; (15) synchronized swiftly rotating masses (vibrator eccentrics); (16) jack screw for upper form end; (17) upper form end; (18) grips for holding longitudinal steel in tension; (19) outer shell; (20) rubber sleeve; (21) wood thermal insulator; (22) I-beam staves, 120 mm.; (23) concrete for the pipe; (24) steel sheets; (25) rubber sleeve; (26) central mandrel; (27) hanger for outer shell; (28) lower form end; (29) tension screw for steel sheets; (30) length of pipe—6 meters; (31) water under pressure; (32) rubber sheets; (33) sealing foil; (34) cross-section of a form; (35) during operations 1 to 5; (36) during operation 6; and (37) during operations 7 to 10





# Precast Units

## RADIANT HEATING SYSTEM with Concrete Floors



Installing floor slabs designed to serve as ducts for warm air heating system

WITH the advent of radiant, or panel floor heating, unusual possibilities for a concrete floor unit to furnish the heating duct surfaces was opened up. When these units are used in a building, the floor can be heated with warm air instead of hot water or steam; since warm air can be circulated through the cores of the unit.

To meet this need, the Spancrete floor units were designed by Ernest W. Davies, Columbus, Ohio. Each standard unit, shown in the illustrations, has three cores,  $5\frac{1}{4}$  in. across. Each core area is the equivalent of a 6-in. round pipe. The Spancrete floor units are hollow precast concrete and are  $7\frac{3}{4}$  in. deep, 21 in. wide, and they are made in lengths up to 30 ft.

The units are made indoors where the weather conditions and the concrete mixes can be better controlled. Each unit weighs approximately 100 lbs. per lineal foot. They are installed by a small portable derrick and can be put in place in any weather that is suitable for laying masonry.

### Core Spaces Used for Heating Ducts

The units have three cores so that lighting fixtures can be centered in the room and the unit. Plumbing and heating outlets are usually provided in the units at the plant, when they are made up; but can be cut on the job if necessary. The  $5\frac{1}{4}$ -in. core space will admit cast iron pipe and

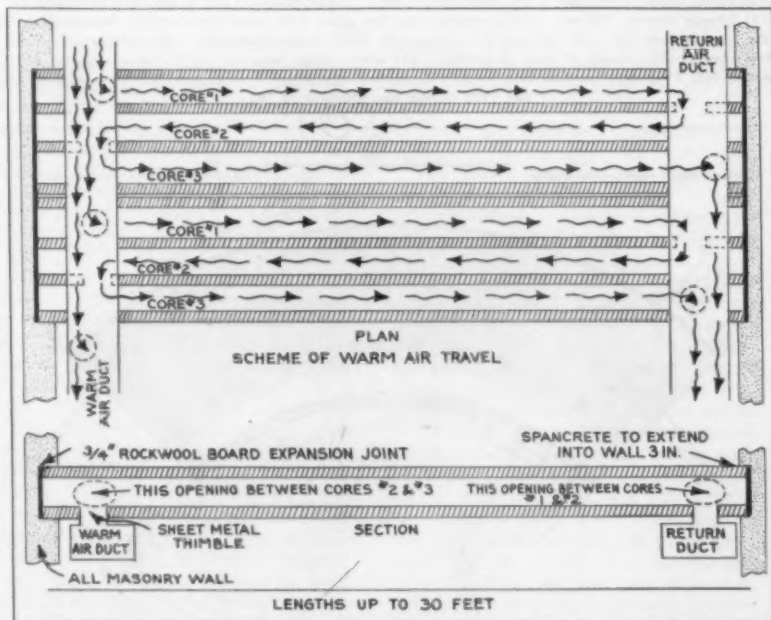
transite flues without impairing the structural strength of the unit. Each job has been planned and laid out by an experienced, qualified engineer, and depends considerably on this for its success.

Warm air at lower velocities and

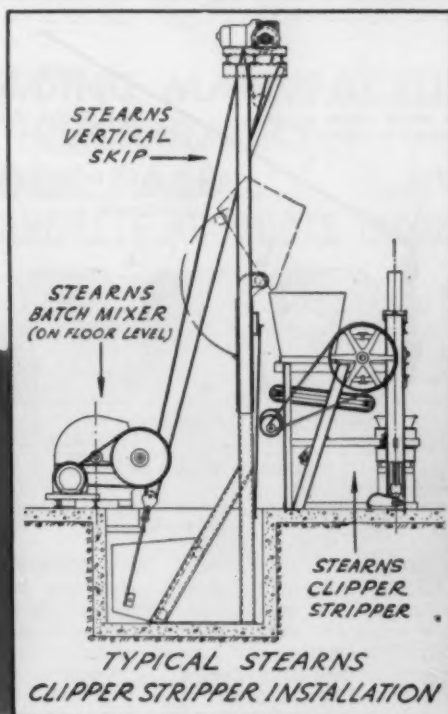
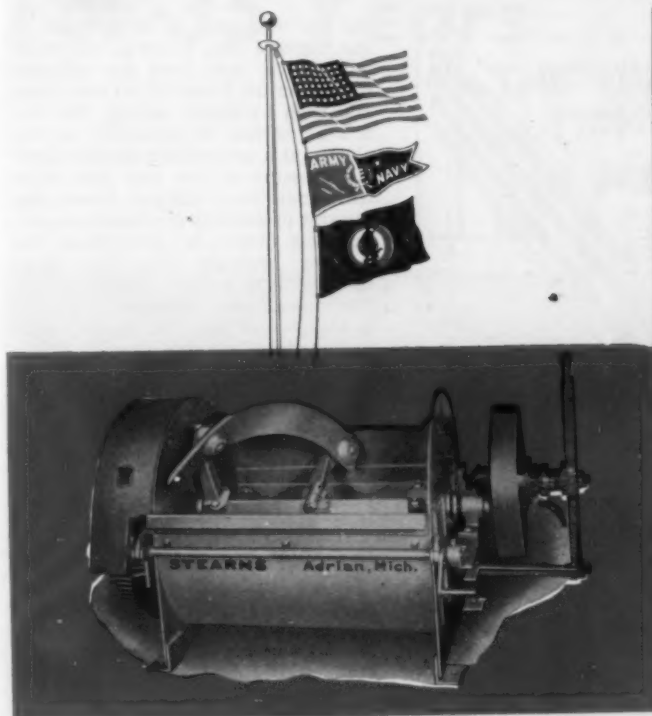
at lower temperatures can be circulated through these large cores. This feature eliminates an objectionable feature of floor heating in the past; that is, hot spots in the floor. Then, too, by using the core spaces for ducts, savings are made in the cost of the sheet metal duct system. The initial cost and the operating cost of a warm air furnace is much less than hot water or steam systems. The small amount of sheet metal duct needed to connect the core spaces is much cheaper than wrought iron or copper pipe imbedded in the poured floor slab. This system also uses more of the floor area for the heating element.

Floor heating is radiant heating and is said to be more desirable than conventional heating; which is the circulation of heated air through the rooms. Conventional heating systems, in re-circulating the air, also carry dust, soot and germs throughout the heated area. The dust and soot makes smudges on the walls and ceilings. With radiant heating, it is believed, such troubles will no longer be a source of worry to the housekeeper. Each room is heated and ventilated independently. Odors are not carried from one room to the others.

(Continued on page 86)



Showing plan and section of concrete floor slabs, indicating flow of warm air to heat rooms



## More Blocks—Less Manpower —That's the Problem!

● Making more and better blocks at lower costs is a problem Stearns Equipment has successfully solved in hundreds of concrete products plants. For instance the—

● Stearns Mixer with its lowest charging height, conveniently located door control and handy bag shelf **reduces manpower to a minimum**. Into each machine is built wear-resisting, quickly shifted, removable liner bars . . . Drums are of steel plate welded to heavy heads . . . Mixing blades of "Sterloy" . . . Bearings: self aligning, anti-friction. Supplied in 12, 18, 28, 42 and 50 cu. ft. capacities with pulley, V-belt or Gear-head motor drive.

● Stearns Skip Loaders also cut manpower costs of elevating mixed concrete

into feeding hoppers and charging dry materials into elevated hoppers. **Push button control** stops bucket in any position . . . Stops automatically when dumped. Easily installed as a separate unit and may be used with any type of mixer. Independent motor or mixer drive types. Proper track and cable lengths permit wide application.

### Performance Speaks Louder Than Words

● Tell us the type of products plant machinery you need and we'll gladly refer you to Stearns-equipped plants located within convenient visiting distance.

● Descriptive Literature covering Stearns Mixers, Skip Loaders, Vibration and Tamp Type block and brick machines will be mailed upon request.

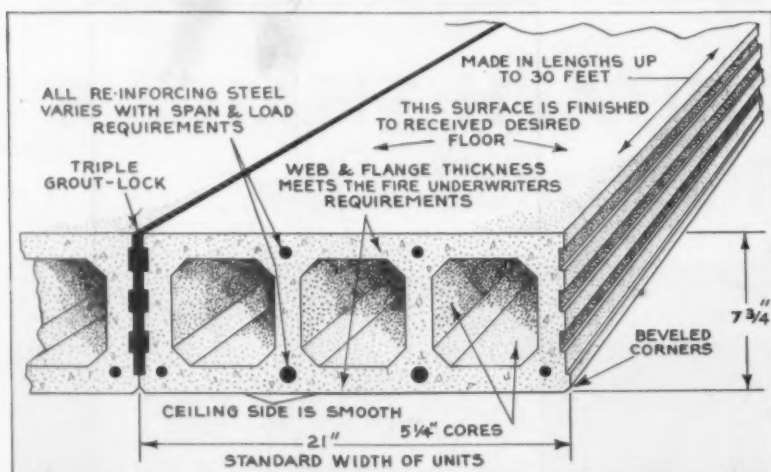
# STEARNS

MANUFACTURING CO., - ADRIAN, MICH.

GENE OLSEN, PRESIDENT  
Designers and manufacturers of vibration and tamp type  
block and brick machines . . . Mixers . . . Skip Loaders.  
Licensed under the basic Gelbman Vibration Patents

ROCK PRODUCTS, September, 1944

## PRECAST UNITS



Details of precast concrete floor slab, showing interlocking feature, which is designed for radiant type heating system

Radiant heating has other advantages. Children playing on the floor are in the warmest part of the room. Older people whose feet are cold due to poor blood circulation, can now be comfortable in radiantly heated homes. Furniture arrangement is simplified with floor heating. There are no heating devices in the walls and floors to take up space. The floor itself is the heater.

These floor units also make quiet rooms. Noises are not transmitted through the floors. Spancrete units extend into the walls about 3 in., leaving no crack around the room at the wall and floor juncture, to permit the passage of dust, sound or vermin.

Any type of floor covering can be used on these units; terrazzo, rubber, cork, or asphalt tile, linoleum, carpet or wood. Provisions are made in the plant for fastening any of these materials to the units.

All-masonry, fire-safe, vermin-proof buildings can now be erected by any builder and at no greater cost than good wood construction. Ceilings can be plastered if desired, but the factory finish is nice enough to paint. This means savings in time and cost to the builder.

On multiple storied buildings, lighter structural frames can be used, because Spancrete reduces floor loads; saves several inches on the height of each story, and it reduces the weight of reinforcing steel used. The floor can be used as soon as placed, so temporary planking is saved.

The flanges and webs of these units are made to conform to Fire Underwriter's requirements for fire resistant construction.

Where it is necessary to carry more than average loads, the flanges can be made deeper to provide extra concrete in compression, and the webs can be made thicker to put more concrete in shear. Moulds used in mak-

ing Spancrete units are portable so that on large projects, requiring many thousands of feet of floor, they can be made close by to save transportation costs.

Owners of the patents on Spancrete will franchise manufacturers to use their equipment and patents. In addition to the floor units, they have also developed a roof unit, which is pre-cast and is installed with the same equipment. These sectional roof units allow for contraction and expansion in the roof without damage to the side walls of the building.

### Freyssinet Process

(Continued from page 83)

setting the reinforcement and inducing tension in the longitudinal bars; setting the central internal core; previous heating of the mold with steam; placing of concrete by vibration and closing the upper cut-off.

**2nd Stage—(Operation 6).** Dewatering the concrete by inducing pressure behind the inner rubber jacket, taking care always to keep a pressure lower than that behind the outer sleeve.

**3rd Stage—(Operations 7 to 12).** Inducing tension in the circumferential reinforcement by enlarging the diameter of the concrete unit through further increasing the pressure behind the inner jacket until it becomes about as much greater than that behind the outer sleeve as the test pressure to which the finished pipe will be subjected. Then, heating by forcing steam between the staves; then, after sufficient heating, releasing the tension on the longitudinal bars; and releasing simultaneously the pressure on both jackets. The inner core assembly is then removed, and, at last, removal of the completed pipe.

The pipe is immediately afterwards taken to the testing apparatus for the following operations: grind-

ing the butt ends to bring them to the required size, filling up the holes left by the jaws used for inducing tension in the longitudinal steel bars, and then hydraulic testing. The hydraulic testing is generally accomplished at a pressure double the working pressure of the pipe line when this ranges up to 130 p.s.i. Above this, the test pressure is decreased proportionately down to 1.25 times the working pressure when the latter reaches 1300 p.s.i. According to M. Freyssinet, these limits can be altered in compliance with the specifications under which the pipe is sold.

**Main Properties of the Pipe.** Since the concrete is highly compressed in three directions, it is said that under the design pressures the steel reinforcement has been prestressed to double the working pressure (about 78,000 p.s.i.), at which point the concrete is under no stress.

In the prospectus and description of manufacturing operations no reference is made to curing—after the pipe is removed from the mold, so it is assumed the cement is hydrated during manufacturing operations and requires no further curing.

**EDITOR'S NOTE:** In a subsequent article Mr. Loving will discuss the design, manufacture and installation of prestressed reinforced concrete pressure pipe manufactured by the Lewistown Pipe Company, Chicago.

### Safety Awards

AMONG THE COMPANIES which have announced that they have won the Portland Cement Association Safety Trophy for 1943 for operation without a lost-time accident are the following: Alpha Portland Cement Co., Ironton, Ohio, plant, the eleventh time this plant has been given the award; Ash Grove Lime & Portland Cement Co., Chanute, Kans., plant, a seventh-time winner; Huron Portland Cement Co., Alpena, Mich., plant; Manitowoc Portland Cement Co., Manitowoc, Wis., a second-time winner and also awarded this year the Distinguished Service Certificate for operating continuously for 1,000 days or over without a disabling accident; Medusa Portland Cement Co., Baybridge, Ohio, plant, another Safety Award winner, also was presented the Distinguished Service Certificate; Missouri Portland Cement Co., Independence, Mo., plant; Nebraska Cement Co., Superior, Nebr., won the Distinguished Service Certificate; Olympic Portland Cement Co., both Bellingham and Concrete, Wash., plants won the Distinguished Service Certificate.

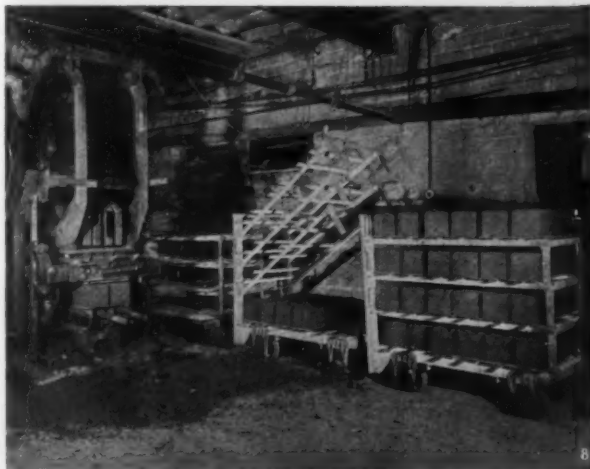
### Lose Equipment

NUGENT SAND CO., Carrollton, Ky., recently lost a set of scales and a hopper float which sank in the Kentucky River.



# For 35 Years...

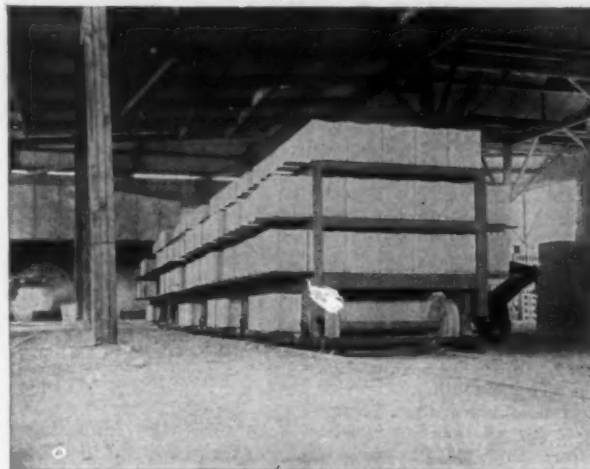
**THE LEADING MANUFACTURER  
of LIFT TRUCK RACKS  
and BLOCK CARS  
for the CONCRETE PRODUCTS INDUSTRY**



● Style 293 Hinged Deck Block Cars in service at the Edmonds Art Stone Company, Washington, D. C.



● Style 294 Hinged Deck Lift Truck Racks in block plant of Cleveland Builders Supply Co., Cleveland, Ohio.



● Style 198 Block Cars for high pressure steam curing at L. G. Randolph Concrete Products Co., Ann Arbor, Michigan.



● Style 2167 Lift Truck Racks with steel decks in the block plant of the Currier Lumber Co., Detroit, Michigan.

**ANY STYLE OR DESIGN LIFT TRUCK RACK  
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## CONCRETE PRODUCTS MACHINERY

Precision-made machinery for quantity and quality production. Each has features that merit your closest investigation.

### Block Machines

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## "ANCHOR"

### Complete EQUIPMENT AND ENGINEERING SERVICE

Equipment for all phases of manufacturing concrete cinder block and other lightweight aggregate units. Our engineering service for new plants and modernizing old ones will help you operate more economically.

Hobbs block machines, Anchor tampers, Anchor Jr. strippers, Stearns power strippers, Stearns Joltcrete, Stearns mixers, pallets, Straublex Oscillating attachments, etc.

Repair parts for Anchor, Ideal, Universal, Stearns, Blystone mixers and others.

### Anchor Concrete Mch. Co.

1191 Fairview Ave., Columbus 8, Ohio



One of a fleet of 1½-ton trucks fitted with following third axes. Trucks formerly limited to 4 or 6 tons of concrete block now can haul 9 tons of block. Five of the 10 trucks equipped with third axes are equipped with 15-ft. instead of 12-ft. beds

## Cut Truck Hauling Costs

**Domine Builders Supply Co., Inc.,  
Rochester, N. Y., transports more  
blocks per load after third axes  
have been installed on its trucks**

By BROR NORDBERG

**T**o reduce the unit cost of delivery of concrete masonry and to conserve equipment and manpower, Domine Builders Supply Co., Inc., Rochester, N. Y., is operating a fleet of trucks equipped with third axes for long hauls up to 100 miles from the plant. The use of extra axle trucks is not a new practice, of course, but is one effective way to make most of existing equipment which must be operated in a period of scarcity.

The company has modern machinery to manufacture sand and gravel block and cinder block for all types of building construction. Practically all sales outside Rochester are made through dealers, with direct delivery through these dealers to construction sites.

At the present time, a considerable volume goes to the farm market through small building supply dealers who usually stockpile surplus concrete units from any truck load. All trucks are fully loaded at the plant. Delivered prices are based on the hauling distance on a zone basis with the charge increasing for every 25-mile increment of haul up to the limit of 100 miles.

The company operates a fleet of ten 1½-ton Chevrolet and Ford

trucks, five of which have been equipped with Truxmore following third axes manufactured by the Truck Equipment Co. The standard trucks haul 4½-ton loads, with one exception, which hauls six tons on short hauls while the extra axle trucks handle the longer hauls with loads of 9 tons. Normal practice was to trade in the trucks every two years and re-install the axes, which are not drive axles, on the new trucks. Axles now in service have been operating for nine years.

Wheel loads and tire limitations were factors in making the installations. Wheel loads, on 32x6 tires, are limited to 2200 lb. per wheel which permits a total load of 11 tons for a 10-tired truck of the type used on long hauls. An overload factor of 10 percent is permissible, which allows the hauling of 9-ton payloads on a truck weighing 2½ tons, which is approximately the weight of the truck with a third axle. Tires are 10-ply heavy-duty type. On the standard trucks, 32x6 tires are used, with the exception of 8.25x20's on one truck that hauls six tons of concrete units.

Trucks equipped with third axes are Fords and heavy-duty Chevrolet models of 85 to 90-hp. instead of the

(Continued on page 90)

## MODERN PLANTS USE "COMMERCIAL" CORED STEEL PALLETS



This is a thoroughly modern plant for its size. Aggregates are received and flow by gravity. The yard is paved. Curing space is under cover. And, of course, it uses "Commercial" Presteel Close-clearance Block Pallets exclusively.

Made of Commercial cored steel, Pallets are lighter in weight and designed for the individual type and size unit being made. This makes possible maximum rack storage, and maximum kiln capacity, and more uniform and quicker curing. Air can circulate fully through core openings.

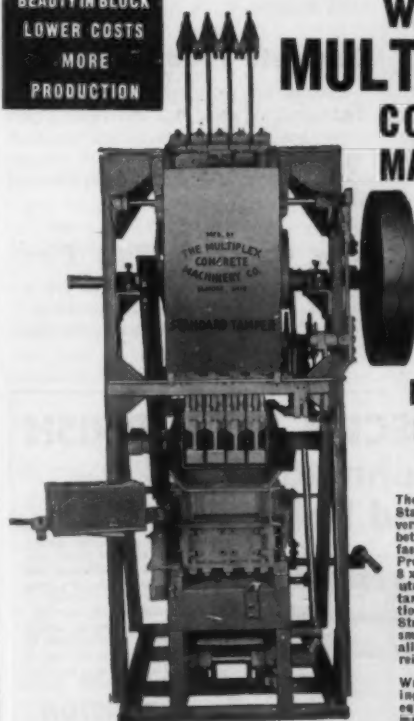
Commercial Presteel Pallets FIT the machine. They produce a mortar groove in the block and a sharp edged block—at lower cost, lower investment and with less labor.

Write today for detailed literature.

*The* **COMMERCIAL SHEARING &  
STAMPING COMPANY**  
YOUNGSTOWN, OHIO.

BEAUTY IN BLOCK  
LOWER COSTS  
MORE  
PRODUCTION

## with MULTIPLEX CONCRETE MACHINERY



There's a MULTI-  
PLEX machine for  
every concrete prod-  
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signed to do its part  
in modern high speed  
mass production of  
finer, high-quality  
concrete products.

### MULTIPLEX STANDARD TAMPER

The MULTIPLEX 8-bar  
Standard Tamper is a uni-  
versal machine for making  
both plain and stripper or  
face blocks, on one base.  
Produces from three to four  
8 x 8 x 16 in. units a min-  
ute. Time-feeding while  
tamping and hopper agitation  
make better units.  
Strike-off hopper assures a  
smooth top. Has rugged,  
all-steel welded frame and  
reinforced moldbox.

Write for booklet describ-  
ing our complete line of  
equipment and vibrating  
machines.

**MULTIPLEX** CONCRETE MACHINERY CO.  
ELMORE, OHIO

## Build CONCRETE Improvements Now! *Help save feed and labor*



A sanitary concrete floor and new concrete masonry walls converted this old farm structure into a modern dairy barn. New concrete milk house (at left) was built at the same time.

Concrete Men! You can help farmers save labor and increase war food production with concrete improvements. The materials required are not critical and are easily available.

The old dairy barn, illustrated above, is an example of the effectiveness of concrete repairs. This structure was restored with concrete for many more years of usefulness.

Timely concrete replacements can add to the life and utility of thousands of other farm buildings.

Phone your farmer friends. Call on them personally—write them letters. Suggest concrete improvements which will save feed and labor. Advertise your services to farmers in local newspapers. Ask us for advertising suggestions for use with farmers. Send for your copy of "Restoring Old Farm Buildings With Concrete." Free in U.S. and Canada.

**PORTLAND CEMENT ASSOCIATION**  
Dept. 9-45, 33 W. Grand Ave., Chicago 10, Illinois

A national organization to improve and extend the uses of concrete...  
through scientific research and engineering field work

**BUY MORE WAR BONDS**



## FASTER CUTTING

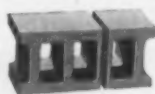
### ...with Clipper Masonry Saws

Your Special Size and Shape Brick or Concrete Block can now be "Tailor Made" at a moment's notice!



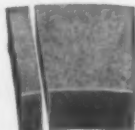
The new Clipper Multiple Cutting Principle makes possible faster cutting of every masonry material regardless of hardness.

Here are a few typical examples of the speed and accuracy with which concrete products and fire brick can be cut.



◊ This concrete block, converted into a special size, was cut completely in two in 19 seconds.

One of the many intricate cuts performed on first quality clay brick for heat treating furnaces.—made in 8 sec.◊



◊ Rotary Kiln Blocks, cut to size for "key" bricks in rotary kilns, require only 10 sec. for completion of cut.

Basic refractories for steel furnaces or cement kilns must be accurately installed. This magnesite brick was cut in 12 seconds!◊



Clipper Saws are available for trial. Write for Descriptive Catalogs.



4005 CHOUTEAU  
ST. LOUIS, MISSOURI

## Cut Hauling Costs

(Continued from page 88)

standard 75-hp. The springs are heavier and carry 16 leaves as compared to eight on the standard models. All trucks are flat-bed types with 12-ft. carrying beds, on the standard 6-wheel sizes. Those equipped for 9-ton loads carry 15-ft. beds, 81-in. wide that are installed on the standard chassis.

The hauling of big loads has resulted in considerable savings in tires and gasoline. Despite the fact that loads upwards of twice as great are carried on the 10-wheel trucks as compared to the 6-wheel jobs, gasoline consumption is only 10 to 15 percent greater.

Domine Builders Supply Co., Inc., started in business 30 years ago and originally manufactured concrete roofing tile. It grew into a sizable building supply firm, and in recent years has become the largest manufacturer of concrete products in Rochester. Just before the war a Besser Vibrapac block machine was installed, and post-war plans are being completed to rebuild the entire plant.

H. P. Domine is president of the company and Harvey H. Black, secretary, is actively conducting the company's business.

## Manufacture Concrete Block Before Building Plant

ERIE SAND AND GRAVEL CO., Erie, Penn., has entered the concrete masonry business in preparation for post-war activities. Unable to wait for new and modern equipment, this company purchased used machinery and placed concrete foundations before the machines arrived so that no time would be lost in establishing sales.

The Besser tamper, the weigh batcher, the mixer and supplementary equipment were set up the week of June 5, and the following week saw production start. Two types of units are being made, the sand and gravel unit and the light-weight Celocrete unit. Some of the blocks will be used

for the construction of low-pressure steam curing rooms and for the building that will house the equipment.

Construction work was directed by Vice-president and General Manager



Construction view of block plant. Foundations for the equipment were laid before the plant building was erected

Joseph J. St. John who advises that the sales staff of the McEnery Company, Erie, Penn., will handle much of the distribution. Although the market will include commercial and industrial uses in the city, it is expected that a larger volume of sales will come from the farm areas adjacent to Erie.

## Concrete Products Plant

DESCHUTES CONCRETE PRODUCTS CO., Redmond, Wash., has received WPB priorities for the construction of a building and installation of equipment to produce masonry units and pipe.

## New Concrete Pipe Plant

TELLER CONSTRUCTION CO., Farmington, N. M., has started production of concrete pipe at their new plant in Farmington.

## BUY BONDS and Keep Them

Your investment in U.S. Victory Bonds is financial ammunition speeding the day of victory.

## YOU SPECIFY-WE FURNISH Better Johnston Steel Racks and Pallets . . .



are built on order to suit your needs. They are the most economical and efficient that can be made for your plant requirements. Johnston racks and pallets are already giving complete satisfaction in numerous plants. Let us handle your requirements.

## JOHNSTON IRON WORKS

1133 Cornelia Ave.  
Chicago 13, Illinois

## From Quarries to Mines

(Continued from page 55)

the Kentucky Stone Co., has been under the direction of President Sam P. Burnam and his associates. These officials have been with the Kentucky Stone Co., and its predecessor companies for many years, and have shared in the responsibilities in building up the company as one of the most progressive stone producers in the country. Mr. Burnam believes in keeping up a close relationship with all the official personnel. He frequently brings them together in conference, and at Derby time it has been the custom to entertain the officials at the races.

Officers of the company in addition to Mr. Burnam are Wiley B. Bryan, chairman of the board; Thomas B. Bullitt, vice-president; Verne C. Morgan, secretary-treasurer; George Wolpert, sales manager; and W. T. Brooks, auditor. Division superintendents are Lister Gaines and H. L. Scherer. Mr. Allen is engineer for the company.

## New Ready Mix Plant

W. G. Block Co., Davenport, Iowa, producers of ready mixed concrete and operating a fleet of four 4-cu. yd. and ten 2-cu. yd. transit mixers, are in the process of setting up a new plant in Davenport. Their old plant at Myrtle street and the river will be discontinued and entirely new equipment will be used at the new plant on Fourth street.

Two steel encased bulk cement bins, having a capacity of 300 bbls. each, fitted into existing concrete bins already have been installed, the steel having been fabricated by the Hawkeye Boiler Machine and Welding Co. Plans include a Blaw-Knox, seven-compartment bin, with Link-Belt elevator, and truck hopper dump. A new garage and shop also will be built. Push button control wherever possible will contribute to the effort to make this new plant as modern as possible. The plant should be in full operation by the spring of 1945. C. A. Mainwaring is president of the W. B. Block Co., and J. R. Northington is vice-president.

## Farmers' Limestone Co.

THE FARMERS' LIMESTONE CO., Cape Girardeau, Mo., has been organized among farmers in Perry County. A plant is to be set up on the Charles P. Kasten farm, and a quarry is to be opened near the banks of Apple Creek in Cape County.

## New Block Concern

J. FISHER CLECKLEY is planning to erect a concrete block manufacturing plant in Orangeburg, S. C., on city-owned property across the river and on the Atlantic Coast Line siding.

Crushed stone and sand will be used for aggregates, the stone to be obtained from Columbia, S. C.

## Wins Safety Award

BESSEMER LIMESTONE AND CEMENT Co., Bessemer, Pa., has been named winner of the 1943 Bureau of Mines accident prevention contest. This company operated 368,483 man-hours during the year without a disabling injury to employees.

## Block for Air Depot

CAPITAL SUPPLY Co., Topeka, Kans., has the contract to furnish concrete block for the new Air Supply Depot near this city. L. V. Hites Construction Co., Kansas City, Mo., is to furnish the concrete and paving.

## Sells Concrete Pipe Works

EARL T. HULL has sold his concrete pipe works in Lancaster, Cal., to Earl McGowan of Southgate and Nelson Swan of Van Nuys. Mr. Hull and his brother Albert started this business in 1921 and were in partnership until the brother's death in 1942. Production is concrete pipe to be used for irrigation on ranches.

## Flux Stone Production

AMERICAN IRON AND STEEL INSTITUTE announced that the steel industry used 24,248,000 tons of limestone for fluxing purposes during 1943. Other fluxes accounted for 563,000 tons. These fluxes were used with 108,025,000 tons of iron ore.

### The Ohio Locomotive Crane Company

USES A

# Climax

## R61 ENGINE

TO POWER THIS OHIO CRANE



This Climax R61, used on the crane below, is a 6 cylinder, valve-in-head engine which develops 166 h.p. at 1200 r.p.m.

## Here is the power plant

for YOUR crane, shovel, dragline, snow-plow, or other equipment.

For stationary or mobile drives; belt, chain or direct-connected, the Climax R61 gives you 166 h. p. at 1200 r. p. m.

The Blue Streak Combustion Chamber gives unusually high horsepower output on little fuel. This chamber causes complete gas mixing and more efficient scavenging, which steps up power delivery and reduces detonation and power losses.



For High Achievement in the Production of War Material

## Climax

### Engineering Company

GENERAL OFFICES A FACTORY:

## CLINTON, IOWA

REGIONAL OFFICES: CHICAGO, ILL. DALLAS, TEXAS

AFFILIATED COMPANIES: McAlister Mfg. Co., Chicago; Hamilton-Walsh Co., Toledo

Cool running is assured by the deep, widely-spaced water passages which surround the cylinder heads and full length of stroke. Operation is possible over a wide speed range without encountering criticals. The low piston speeds and compression ratios guarantee minimum up-keep cost and long life.

Maintenance is inexpensive and easy, and can be done by any local mechanic. The overhead valves make grinding simple, and there are no extremely close tolerances to be maintained.



CLIMAX ENGINES are 4, 6, 8 and 12 cylinder gas engines with ratings from 40 to 495 h.p. Climax Diesel engines are made in two models rated at 22 and 44 h.p. The gas engines operate

on natural gas, butane, or gasoline. The Diesels use standard grade fuel oil.

WRITE FOR INFORMATION —to Climax Engineering Company, 1810 South Fourth St., Clinton, Iowa.

## Mexican Cement Problem

(Continued from page 62)

under construction and may be ready to operate latter part of 1944.

Monterrey del Norte, Monterrey, N. L.: Will produce slag cement utilizing clinker from Cementos Mexicanos plant at Monterrey. Only grinding plant being installed. May operate towards latter part of 1944.

Cementos del Pacifico, Mazatlan, Sin.: Has one-kiln plant under construction and may be ready to operate in late fall of 1944.

Cementos Veracruz, S. A. Orizaba, Ver.: Has two-kiln plant under construction and expected to start operations in March, 1945.

Cementos Anahuac, S. A. Cuernavaca, Mor.: Has one-kiln plant under construction and may start operations in late fall of 1944.

Cementos de Yucatan, Merida, Yucatan: This project has been abandoned.

### Conclusions

Unless the railway situation improves greatly during the latter half of the year 1944 existing cement producers will do well to match tonnage performance of 1943 notwithstanding the fact that most plants have added capacity during the past year. Main deficiency continues to be difficulty in obtaining sufficient fuel oil due to

break down in the railway transportation system which also has affected companies dependent upon their limestone and gypsum requirements located at points distant from factories. American Railway Commission in Mexico during the past year is working with the Mexican Government trying to solve railway transportation difficulties but various estimates hold that it will take up to five years to reorganize and repair railways and rolling stock to permit their normal functioning.

As concerns fuel shortage, this is laid to the railways who have insufficient oil tank cars or locomotives to move them. A number of cement companies have purchased oil cars as a partial solution to their fuel oil shortage problem.

As concerns limestone shortage at those plants dependent on raw materials from distant quarries, and notwithstanding the fact they have their own railway cars, shortage of locomotives to move them still constitutes a grave problem.

As concerns established plants importing additional cement equipment from the United States, as well as new plants under construction, the embargo placed by the American Association of Railways on cars to Mexico earlier in the year, and again during June, has not permitted the new companies to get their plants built according to schedule and a continuation of the embargo which is still in effect as of August 1, will result in further delays.

In general, if the railway situation is such as at present whereby existing plants are shut down or operate spasmodically due to lack of fuel oil and shortage of limestone, it is not clearly seen how new plants upon becoming ready for operation can hope for any better, if as good service from the various railways serving them.

Due to the factors above mentioned, it is doubted that the total Mexican cement production for the year 1944 will exceed 750,000 metric tons which is considerably less than the 1,081,700 tons of production estimated, and unless conditions for cement manufacture become more favorable the industry as a whole will do well to produce 1,000,000 metric tons in 1945 as compared with the 1,430,800 tons estimated.

### Projected Gypsum Plant

NATIONAL GYPSUM Co., Buffalo, N. Y., has received approval from the Baltimore Board of Estimates for construction of a gypsum plant to be built in the city. The contract calls for the construction of a pier on the Canton harbor front at a cost of \$967,000 to \$1,250,000. A rental rate of 3½ percent of the total cost for 30 years, plus the interest rate of bonds issued by the city for construction of the pier and facilities will be paid by the company.

## WANT YOUR MOTO-MIXER TO

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• LAST LONGER?

• OPERATE MORE ECONOMICALLY?

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FREE BOOK

Here's the book that tells you just what and what not to do to get the most from your Rex Moto-Mixer! It tells you how to clean your machine and how often... how to take care of the chain drive... how to care for the water system, the drum rollers, drum brakes, transmission, engine and other important parts. You'll find information on lubrication, and complete lubrication charts. And you'll find valuable hints on operating that will enable you to get the most from your Moto-Mixer. There's a check list that will simplify your periodic check ups.

Send for your Free copy of "A Guide to the Wartime Care and Maintenance of Rex Moto-Mixers," today! You'll find it written in a free-and-easy manner that will make you really enjoy reading it. Address Chain Belt Company, 1695 West Bruce Street, Milwaukee 4, Wis.



**REX**

CHAIN BELT COMPANY OF MILWAUKEE  
CONSTRUCTION MACHINERY



PUMPS



PAVERS



PUMPCRETES



MOTO MIXERS



MIXERS



## Control Concrete Quality

(Continued from page 66)

of cement in the hopper nears the correct figure and stop them when the exact predetermined weight has been reached. A magnetic brake stops the screw with a minimum of coasting. Aggregates and water are weighed into separate compartments of the aggregate hopper. This is connected to a Toledo (SC)<sup>2</sup> compensator scale which automatically compensates for the moisture carried by the aggregates. The operation is as follows:

### How System Operates

The compensator scale includes in addition to the full dial, a separate beam and poise for each ingredient including water. Each aggregate has assigned to it a compensating type poise with a hanger to which small discs calibrated in percent of the poise weight are added. Thus at the start of weighing a batch the sand poise is set at the dry weight of sand required and discs totaling the percent of surface moisture carried by the sand are added to its hanger. The dial indicator then shows the correct total weight of sand required before any material is weighed out giving the operator an independent check on the setting. The proper gate is then opened and as the sand enters the weigh hopper the indicator moves backward reaching zero when the correct amount has been weighed. The coarse aggregate poise is then set, percentage discs for the correction of its free water are added to the poise, and the coarse aggregate is weighed in the same manner as the sand. The water is weighed last by setting the poise assigned to this to the total weight of water required for the batch without regard to the surface moisture in the aggregates. Accurate compensation for this moisture is accomplished by simply removing the discs previously added to the sand and stone poises. The water valve is opened manually and is closed automatically when the correct weight has been reached. A solenoid actuated by mercury switches in the scale governs this cut-off. By the above method the dry weight of each aggregate and the total amount of water in any batch can be controlled to very close limits without any calculations by simply using the correct percentage discs as indicated by the moisture tests.

Another feature of the batching system is the twin graphic recorder which makes a permanent graphic record of the weight of every ingredient weighed on either batching scale. This recorder is operated electrically by means of Selsyn motors and is located at present on a wall of the batching floor but will be installed in the new dispatchers office now under construction so that the

dispatcher can check each batch as its delivery ticket is being made out.

### Transit Mixer Equipment

The mixes themselves are designed on a strength plus slump basis, there being three different mixes for each strength classification so that concrete having a slump of two inches, four inches, or six inches can be batched for each strength class.

All ingredients are discharged simultaneously into a collecting hopper and thence into the truck mixer. A small electric motor, operated by the weighman lowers a canvas shroud into the charging opening of the mixer to avoid spilling any material.

Jaeger high discharge mixers of 3- and 4-cu. yd. capacity are used by this company almost exclusively. These are mounted on a fleet of 38 International, Mack, and White trucks. The mixer drums are washed out after each batch and this water is dumped before the next load to eliminate any possibility of variations due to this factor.

A 150 hp. horizontal air compressor supplies air at 120 lbs. pressure for operating the air activated cement elevating system and for various other uses around the plant. A 60 hp. boiler is now being installed to assure an adequate supply of hot water

(Continued on page 94)



## Why cost-minded producers are installing *Simplicity* gyrating screens

There's nothing mysterious about the outstanding sales success of *Simplicity* gyrating screens in the aggregate industry. Producers are simply comparing first costs, depreciation costs, maintenance costs, and production speed of *Simplicity* units. And they soon see that *Simplicity's* give them by far the greatest value for their money.

*Simplicity* screens offer you a wealth of outstanding features including: Counterbalanced eccentric shaft; rubber-mounted screen corners, screens in four-way tension over doubly crowned surface, dust-sealed Alemite lubricated roller bearings; extra rugged construction.

You, too, will find that *Simplicity* gyrating screens will help you whittle down your processing costs, help you maintain greater production schedules. Write today for complete facts.



Right: A 5'x12' Model D double deck *Simplicity* gyrating screen.

# Simplicity

ENGINEERING COMPANY • DURAND MICH.

# AMERICAN CRUSHERS

## are rugged!



**Rugged**—that's the Army's word for any job or anything calling for grit and perseverance. The jobs American Crushers are doing day after day fit into that definition; for American Crushers themselves are ruggedly built. They are made of the finest, toughest materials—manganese steel wearing parts, alloy steel shaft, heavy duty anti-friction bearings

enclosed in dust-tight pillow blocks and cast steel discs, two inches thick.

## AMERICAN PULVERIZER CO.

1245 MACKLIND AVE., ST. LOUIS 10, MO.

## Big Savings



The above picture of a small Sauerman Scraper digging gravel from pit and delivering to crushing plant shows the simple effectiveness of this method. This Sauerman machine uses 4½ gals. of gasoline to move 45 cu. yd. of material per hour.

### SEND FOR THIS CATALOG

The Sauerman Catalog pictures and describes many typical projects where materials are being dug, hauled and placed at costs of a few cents per yard. A copy of this useful book is yours for the asking.

## SAUERMAN BROS., INC.

530 S. Clinton St., Chicago 7, Illinois

### dig, haul and dump for few cents a yard!

Where materials are to be moved distances of several hundred feet or more, a SAUERMAN Drag Scraper or Cableway can cut the cost per cubic yard to a low figure because it is able to dig, haul and place the material in a continuous automatic movement, doing away with the expense of rehandling. The operation is smooth and rapid, producing large yardage with moderate expenditure of power.

The first cost of a SAUERMAN Machine is reasonable, maintenance amounts to very little, and the simplicity of operation makes it possible to place the control of even the largest installation in the hands of one operator. Moreover, the machine is very flexible, hence easily adapted to different jobs.



and steam for heating the aggregates next winter. A 500-gal. insulated tank mounted on the batching floor insures plenty of hot water when needed. A cold water line to the bin has been provided so that the temperature of the concrete can be controlled readily on mild winter days when there is a possibility of the concrete being delivered too hot. For extra long hauls a bypass valve permits placing of the weighed mixing water into the tank of the mixer to be added later by the driver instead of placing this directly into the drum as is usually done.

The Goff-Kirby Co. plans to erect a new batching plant at their East Cleveland yard this fall. According to Mr. L. A. Kemter who is in charge of all concrete production, the new set-up will include all the control features which are proving so successful in their present plant.

The officers of this company include William Goldie, president and general manager; L. A. Kemter, operating superintendent; and O. B. Loomis, secretary-treasurer.

### Abrasive Materials Increase

NATURAL ABRASIVES increased in total value three percent in 1943 compared with 1942, according to the Bureau of Mines. Garnet, emery, quartz and ground sand and sandstone in 1943 had substantially higher values than in 1942. No figures were available for Diatomite.

Production of tripoli in 1943 decreased 15 percent to 14,912 tons valued at \$244,365. Sales of crude, crushed and ground quartz advanced sharply in 1943, amounting to 99,445 tons valued at \$346,558. Ground sand and sandstone sales in 1943 totaled 541,350 tons valued at \$3,937,452 or 8 percent more in value than 1942. In 1943 sales of grinding and polishing sand totaled 837,662 tons valued at \$1,428,463. Total sales of grinding pebbles and tube-mill liners in 1943 decreased 31 percent in both quantity and value compared with 1942. Sales of grinding pebbles were 36 percent under 1942. Tube-mill liners remained at virtually the same level as in 1942. Grinding pebbles were produced in California, Minnesota, North Carolina, Texas, and Wisconsin, and tube mill liners were reported from Minnesota, North Carolina, and Wisconsin. Production of grinding pebbles in 1943 was 9,924 tons valued at \$157,778; tube-mill liner production was 2585 tons valued at \$46,071.

### Win Safety Contest

DRAGO CORPORATION, Keystone Sand Division, Pittsburgh, Penn., has been named winner of the 15th annual safety contest among sand and gravel operators of America by the Federal Bureau of Mines and National Sand and Gravel Association. This company operated 223,938 man-hours in 1943 with no injuries or disabilities.

## Reclamation Bureau Buying Pipe

RECLAMATION BUREAU, Department of the Interior, has asked for bids for 10,590 ft. of precast concrete culvert pipe in various sizes for the construction project at Deschutes, Ore. Quantities required are as follows: 4200 linear feet 18-in. pipe; 4380 linear feet 24-in.; 1050 linear feet 30-in.; and 960 linear feet 36-in.

## Talc Development

SIERRA TALC CO., Goldfield, Nev., operators of a large talc property, plan an extensive development program to increase reserves of profitable mineral. They plan to drive a 1000 ft. tunnel 700 ft. below the crest of the mineralized ridge through which talc will be mined. The mineral is obtained at present from deposits on top of the high ridge, but the company hopes to find higher grade talc at depth. Exploratory and development work will be carried on from the bore.

## New Silica Plant

BELLINGHAM IRON WORKS, INC., Bellingham, Wash., plans to start the operation of a silica plant in the new mining division. A. W. Talbot, president of the company, reported the company had acquired silica mining deposits in the upper Skagit region. Patent rights also have been secured for a new mill. The company has contracted with a glass factory to supply 1200 tons of ground silica a month.

## Rifting Plant Opened

CUSTER MINING ACCOUNT CO., has opened a mica rifting plant in Deadwood, S.D., according to Harold Hedman of Custer, S. D., manager of the Victory Mica mine, largest mica producer in the Custer district. Mica will be hauled from Custer and the condenser sheet mica rifted from the lot and the scrap mica will be shipped out.

## Wolverine Improvements

WOLVERINE PORTLAND CEMENT CO., which operates two plants, at Quincy and Coldwater, Mich., is planning extensive improvements at its two plants. President Roger Gleason reports that the directors have approved plans which call for purchase of additional machinery and consolidation of certain present facilities.

## Mica Exploration

U. S. GEOLOGICAL SURVEY, through a branch office in Asheville, N. C., is mapping the mica mines in the Piedmont section of North Carolina. R. H. Johns, survey director for the Southeastern states says that the Bess mine, 12 miles from Shelby, has become one of the biggest mica producers in the Southwest.

# "PENNSYLVANIA"



**STEELBUILT** Single Rolls, in 9 sizes, assure uninterrupted, low cost primary crushing for large, medium and small Cement, Lime and Gypsum Plants.

"Pennsylvania" REVERSIBLE Hammermills, in 15 sizes, prepare these primary products to required specifications with higher efficiency and lower operating cost than previously available.

Our Engineers are at your service for cooperative study and recommendations.



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Philadelphia 7, Pa.

Associated with Fraser & Chalmers Engineering Works, London.

## STEELBUILT CRUSHERS

BELT MAN LUKE SAYS . . .



"When it comes to belt fasteners, Talcott's top them all. The strongest, safest, the easiest and quickest to apply, and one of the lowest cost fasteners on the market."

## TALCOTT BELT FASTENERS

Talcott Conveyor Belt Fasteners are made in short sections which allow the belt its full pliability so it will readily conform to the trough-riders and also will run smoothly under trippers, scrapers and on tandem drives. The teeth of Talcott Fasteners pierce between the threads of the warp of the belt, wedging the fibres more closely together without cutting or breaking them. This prevents the belts from breaking at the joint.

► For Splicing and Patching Conveyor, Elevator and Transmission Belts.

### TALCOTT'S ACME STEEL PATCH FASTENERS

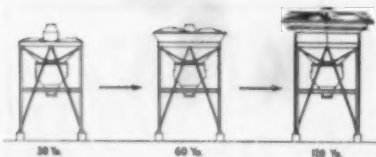
The handiest fastener made for splicing and patching tears in conveyor belting. Patches are easily and quickly made.



Only a Hammer Is Needed to Apply Talcott Fasteners.

**W. O. & M. W. TALCOTT, INC.**  
92 SABIN STREET PROVIDENCE, R. I.





*Get Ready for*  
**TOMORROW...TODAY**  
with a Step-By-Step  
**CENTRAL MIX PLANT**

A Johnson Step-by-Step Mix Plant is an efficient, economical performer at every stage of your business development. When volume justifies expansion, it is readily and cheaply converted from a 30-yard 2 Material Plant to a 60-yard or 120-yard 2, 3 or 4 material. In all sizes two distinctive Johnson features pay continuous dividends.

**(1) CONCENTRIC AGGREGATE CEMENT BATCHER.** Inter-mingling of aggregates with cement when discharged assures a 20% pre-mix and pre-shrinkage, providing a full capacity mixer charge. Prevention of any large amount of cement touching wet mixer walls eliminates gumming and excessive wear. Cement dusting is reduced.

**(2) IMPROVED JOHNSON WEIGH BEAMS,** equipped with reliable moisture graduation permit prompt and convenient adjustment for moisture content... assure precision batching that meets the most rigid inspections. Write for full particulars.

Write for Data on  
**JOHNSON'S  
ELEVATORS  
CLAM-SHELL BUCKETS  
CEMENT STORAGE SILOS  
BATCHERS**

**THE C. S. JOHNSON COMPANY**  
Champaign, Illinois

## Ready Mixed Concrete Directors Meet

(Continued from page 78)

Board rulings for the construction industry unless a producer has his plant within the actual territorial limits of a government project. In many instances, the Operating Engineers Union has made attempts to get the ready-mixed concrete industry classified as construction, which as an industry has much higher wage scales than those that prevail for the ready-mixed concrete industry. Mr. Ahearn urged producers to communicate with his office before making any changes in their wage scales to conform with construction rates, since recognition that the two industries should have differing rates of pay has already been obtained in Washington.

In his discussion of Wage and Hour Division provisions, Mr. Ahearn stated that the fact that cement comes from outside a State or that concrete is placed on federal roads does not make a producer subject to its provisions. Rather, the industry does operate under Executive Order 9240.

In the matter of price controls, it was the consensus at the meeting that producers operating plants that were in operation before March, 1942, should not, as an industry, seek price relief at this time. Mr. Ahearn suggested that producers publish price lists since they will be valuable evidence should price relief be sought.

Exemption of the industry from renegotiation was denied in 1943, said Mr. Ahearn, but the Association will continue to work for such exemption and he believes there is a chance of having it granted. A number of producers at the meeting have already undergone renegotiation and their experiences were related in informal discussion.

As to War Manpower Commission Regulations, Mr. Ahearn said that because the industry is not on the list of essential industries only means that it is not regarded as essential nationally, but that local declarations of necessity will govern. In his opinion, the fact that only essential construction is permitted now is good evidence that the producer furnishing

the concrete is engaged in an essential activity. Instances were mentioned where producers have been declared essential and are able to secure the necessary manpower.

A motion was passed that the Association call attention to WPB that a shortage of truck parts is causing long layoffs of trucks. Apparently the industry is getting along reasonably well in matters of priorities with the exception of certain small truck parts and heavy-duty truck tires. It is not so much a matter of securing necessary priorities as it is of actual shortages. Provisions of L-41 will be relaxed considerably when Germany is defeated, in Mr. Ahearn's opinion.

In the absence of Bob Collins, chairman of the committee on merchandising, the recommendations of his committee were read. A motion was passed that the Association secure sample sale contracts from the membership so that each member will have an opportunity to study them for up-to-date clauses that might be of benefit. The committee recommended in its report that consideration be given to the preparation of articles to acquaint contractors with limitations on delivery equipment, etc., and the placing of advertisements in construction and building papers to promote the use of ready-mixed concrete.

At the conclusion of the meeting, all producers in attendance were asked to estimate the volume of business they anticipate for the year 1944 as compared to 1943.

### Business Reports

From the reports, which cover areas in most sections of the country, the average was that 1944 volume of business would be approximately 50 percent that of 1943. There were a few outstanding exceptions. C. D. Gray, Indianapolis, Ind., expects his 1944 volume to at least equal that of 1943. F. P. Spratlen, Jr., Denver, Colo., expects almost to equal 1943 volume, due principally to railroad round-house construction and maintenance on big structures. E. J. Nunan, Buffalo, N. Y., expects a volume 70 per-



Directors' meeting of National Ready Mixed Concrete Association comes to order with President Stephen Stepanian giving his opening address

cent as great as in 1943 after a very slow start in 1944.

Miscellaneous repair jobs involving small yardages in the 200 to 750 cu. yd. range are coming in more and more, which is a favorable sign, and it is of interest that several producers are expecting a steady rise in volume toward the end of the year.

The registration was as follows:

#### Registration

V. P. Ahearn, National Ready Mixed Concrete Assn., Washington, D. C.  
Q. W. Best, Consolidated Rock Products Co., Los Angeles, Calif.

Claude L. Clark, Ohio Ready Mixed Concrete Assn., Columbus, Ohio.

B. F. Devine, Chain Belt Co., Milwaukee, Wis.

Joseph Dixey, Transit-Mix Concrete Corporation, New York, N. Y.

Clarence E. Ehle, The Cleveland Builders Supply Co., Cleveland, Ohio.

R. C. Fletcher, Flint Crushed Gravel Co., Des Moines, Iowa.

Alexander Foster, Jr., Warner Co., Philadelphia, Pa.

William Goldie, The Goff-Kirby Co., Cleveland, Ohio.

C. Gray, Ready Mixed Concrete Corporation, Indianapolis, Ind.

Louis G. Hilkemeier, Chain Belt Co., Milwaukee, Wis.

Mrs. M. M. Himmier, National Ready Mixed Concrete Assn., Washington, D. C.

Walter F. Jahncke, Jahncke Service, Inc., New Orleans, La.

Kenneth P. Kerr, Butler Bin Co., Waukegan, Wis.

James F. McCracken, American Builders Supply Co., Louisville, Ky.

R. McLean, Jaeger Machine Co., Columbus, Ohio.

Charles P. Maloney, Maloney Concrete Co., Washington, D. C.

Robert Mitchell, Consolidated Rock Products Co., Los Angeles, Calif.

William Moore, J. P. O'Connell Co., Boston, Mass.

Bror Nordberg, Rock Products, Chicago, Ill.

E. J. Nunan, Buffalo Slag Co., Buffalo, N. Y.

H. P. G. Pelsue, Metropolitan Sand and Gravel Corp., Port Washington, N. Y.

H. C. Peters, The T. L. Smith Co., Milwaukee, Wis.

Stanley A. Phillips, Pit and Quarry, Chicago, Ill.

T. E. Popplewell, Fort Worth Sand and Gravel Co., Fort Worth, Texas.

Robert F. Porter, Harry T. Campbell Sons Corporation, Towson, Md.

John Prince, Stewart Sand and Material Co., Kansas City, Mo.

Nathan C. Rockwood, Rock Products, Chicago, Ill.

Joseph M. Scheinin, James A. Norton, Inc., New York, N. Y.

A. R. Shiely, Guaranteed Concrete Co., St. Paul, Minn.

C. W. Shirey, Waterloo, Iowa.

Frank P. Spratlen, Jr., Ready Mixed Concrete Co., Denver, Colo.

Stephen Stepanian, The Arrow Sand and Gravel Co., Columbus, Ohio.

H. F. Thomson, General Material Co., St. Louis, Mo.

Stanton Walker, National Ready Mixed Concrete Assn., Washington, D. C.

Julius J. Warner, Richter Concrete Corporation, Cincinnati, Ohio.

J. C. Witt, Marquette Cement Mfg. Co., Chicago, Ill.

#### New Limestone Mill

OREGON PORTLAND CEMENT CO., Portland, Ore., has put in a \$25,000 mill at its Oswego plant which will be used to produce agricultural limestone.

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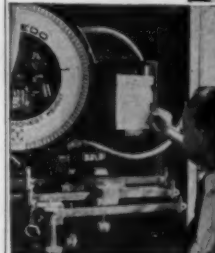
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## Calcining Behavior

(Continued from page 71)

tary rate of weight loss. The lower curve is the total weight loss or gain, depending upon whether dissociation or recarbonization is taking place. The shaded area, in its vertical extent, represents the weight loss when above the temperature line and the weight gain when below the temperature line. Each small square represents a weight difference indicated by the scale given.

Most of the weight loss occurs at the points of greatest temperature deflation, as would be expected, but, in referring to  $MgCO_3$ , while most of the weight was lost at 1380 deg. F., the most important point is that a portion of the weight was lost before and some even below the 1000 deg. F. point.

The test was then repeated at a much slower rate (Fig. 7). In the first test, magnesium carbonate dissociation extended over only 20 minutes, while in this second case it was stretched over 80 minutes. The weight loss was about double the loss for any given temperature at the faster rate. The initial loss of weight took place at about 950 deg. F.

Although this slower rate of dissociation was about as slow as that prevailing in a rotary kiln, it still was far faster than that for a vertical kiln. For example, in the test represented by Fig. 4, stone was passing through the magnesia zone for almost 24 hr. Another test was run, at a still lower heating rate, and the

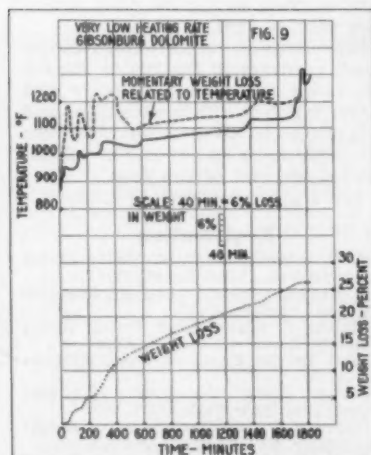


Fig. 9: Finely pulverized sample of dolomite was tested over a 30-hr. period

test results are presented in Fig. 8.

Initial loss again took place at about 950 deg. F. Temperature was then maintained about constant at 1000 deg. F. At first there was a losing of weight, which came to a stop after a time. Temperature was raised to 1100 deg. F. and dissociation resumed and continued at a very slowly reducing rate. This test was for nine hours' duration and indications are that, if it had continued the full weight loss would have taken place at the 1100 deg. F. temperature and possibly even at a slightly lower temperature.

(Continued on page 100)

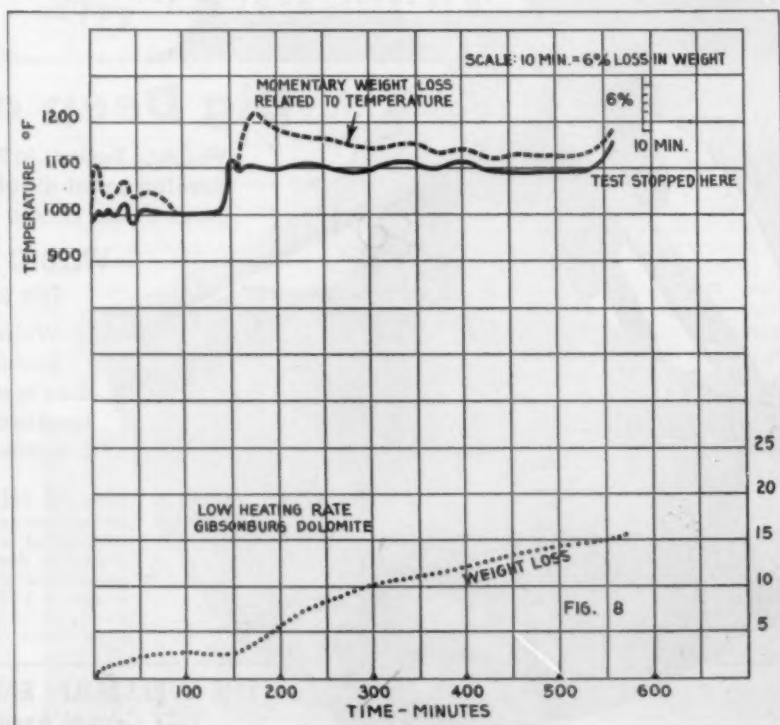


Fig. 8: Results of test at a slow rate of dissociation



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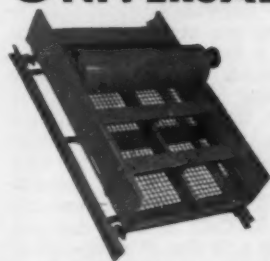
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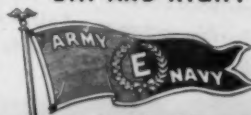
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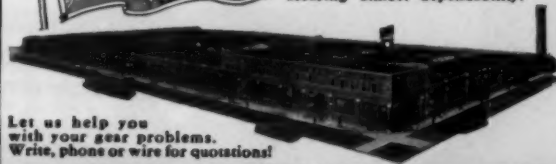
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## Calcining Behavior

(Continued from page 98)

Next, a 30 hr. test was undertaken (Fig. 9). This time a finely pulverized sample of dolomite was used. The test was run in long periods. During the first period of the test, temperature was maintained at 950 deg. F. There was about 2½ in. of weight loss, after which dissociation stopped. During the second period, at a temperature of 1000 deg. F., a further 2½ in. of weight was lost, after which action came to an end.

All these tests were conducted with a CO<sub>2</sub> concentration of 100 percent. In kilns where CO<sub>2</sub> concentration is

only about 35 percent or less, initial dissociation would take place at a much lower temperature (Fig. 1), a fact which brings these laboratory experiments completely in line with field observations and fully explains the low temperature prevailing in the magnesite portion of dolomitic kilns.

Fig. 10 represents a test on powdered California magnesite. Initial dissociation takes place at a temperature lower by about 75 deg. F. than that for MgCO<sub>3</sub> in dolomite and about that much below the temperature claimed for MgCO<sub>3</sub> by Marc and Simek. The heating is rapid and the dissociation is feeble at the lower

temperatures but becomes rather energetic at 1125 deg. F., which ties this experiment up effectively with the experiment represented by "C" of Fig. 2.

Fig. 11 gives comparative rates of dissociation for MgCO<sub>3</sub> of magnesite and dolomite for the same heating rate. Dissociation of magnesite starts earlier and is more energetic throughout. Completion of dissociation is only slightly earlier than in the case of dolomite and at a slightly lower temperature, but in the interval the magnesite lost about half its weight, while dolomite lost only about one-fourth of its weight. Area height in Fig. 11 represents momentary rate of CO<sub>2</sub> loss at any given temperature. Total area is total loss.

High calcium stone specimens, of which many were tested, do not show this retarding effect. At the dissociation point of 1648 deg. F., CO<sub>2</sub> escapes readily and rapidly, and the temperature of the specimen remains almost constant at this point until toward the end, when only small amounts of CO<sub>2</sub> are still remaining.

But even in this case, when large crystals of calcite are considered, there is a strange retarding effect. Calcite crystals were heated to 1800 deg. F., removed, the surface scraped and underneath the specimen was still an unchanged transparent crystal.

A test was then run similar to those represented by Fig. 2, with the exception that while one specimen was a ½ x ½ x 1-in. pellet of oolitic limestone, the other was exactly the same weight of calcite crystal. The two were drilled for insertion of a fine wire thermocouple, each of which was connected to a potentiometer. The furnace was heated and the temperature of each alternately recorded every second minute. Fig. 12 shows how the calcite dissociation reaction lagged. While the limestone was completely converted to CaO in 20½ minutes' time during a 50 deg. F. temperature rise, the calcite required 37½ minutes in time and 195 deg. F. in tem-



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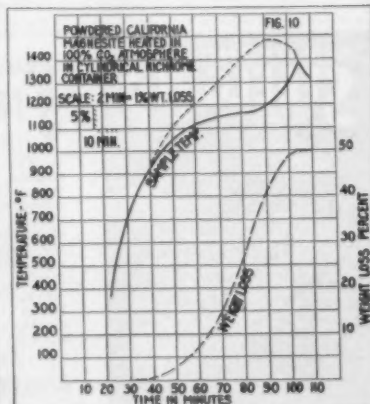


Fig. 10: Test results on powdered California magnesite

perature rise. Since dissociation rate varies as the vapor tension difference of  $\text{CO}_2$ , the calcite required a tremendous internal  $\text{CO}_2$  pressure and an effort many times greater than the limestone.

In the final analysis any of the samples is crystalline and ultimately limestone is as much calcite as calcite itself, so the explanation for this difference likely is the ability of  $\text{CO}_2$

DISSOCIATION TEMPERATURE OF  $\text{MgCO}_3$  AT ONE ATMOSPHERE  $\text{CO}_2$  TENSION

	Initial Dissociation	Slow Rate Dissociation (Continuous)	High Rate
Dolomite	960 deg. F.	1025 deg. F.	1380 deg. F.
Magnesite	800 deg. F.	950 deg. F.	1125 deg. F.

to escape. In some cases it has a free exit while in others it must develop an immense pressure to force itself out. This probably is responsible for the retarding effect in the dissociation of all magnesite, dolomite and calcite. One may now be permitted to formulate the following conclusions:

Dissociation temperature varies with the vapor tension of  $\text{CO}_2$  at the phase boundary, it varies with the depth of the phase boundary below the outer surface, it varies with the density of the interposed layer, and varies with the rate of conversion, being much higher for the higher rates of dissociation.

The general assumption was that magnesium carbonate and calcium carbonate in dolomite form a compound having a definite dissociating

point. But this is not so as it was found that, depending on the rate of heating, dissociation of the magnesium carbonate portion may be at any temperature and at a low enough rate of heating may occur down at the dissociation temperature of pure magnesite.

As it appears, there are six sets of dissociation points for  $\text{MgCO}_3$ , of dolomite and magnesite, as follows:

It is suspected that the initial point for dolomite and magnesite would be the same if sufficient time would be given to overcome the lag normal to dolomite.

The "Slow Rate Continuous" temperature, if adjusted to the proper  $\text{CO}_2$  tension, would apply to kilns of the vertical type of long time factor.

The "High Rate" would apply to rotary kilns and most laboratory experiments.

It seems that while dolomite may have an orderly interlocked arrangement of alternating  $\text{CaCO}_3$ ,  $\text{MgCO}_3$  unit cells and show a distinct X-ray pattern, there is no other sort of combination and the two carbonates do not create a compound. They are two not separate but distinct entities. The fact that dissociation of the magnesium carbonate portion

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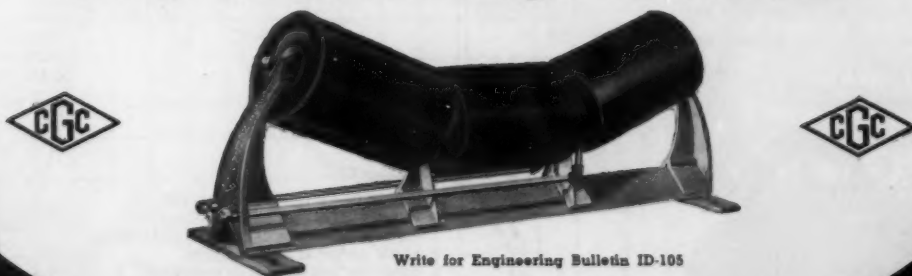
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does not take place freely as it does with free magnesite is possibly due to  $\text{CO}_2$  not being able to escape readily due to obstruction by the undissociated calcium carbonate cells. There is a resistance to gas escape so, on rise of temperature, dissociation rate increases, because  $\text{CO}_2$  tension is raised, enabling it to force itself out. This would be also indicated by the very slow recarbonation of  $\text{CaO}$  from calcite compared to limestone (see Fig. 12). It is all purely a mechanical phenomenon.

It is natural that there was so much confusion and that completely faulty dissociation tables were accepted, as laboratory dissociation tests are not run over the many hours given during this series and most investigators have little opportunity to observe the behavior in the field.

These findings are all of great practical value. It now permits more correct estimation of the thermal efficiency of magnesium and dolomitic kilns. It reveals, in the case of dolomite, that most of the magnesium carbonate is dissociated with heat that would go to waste in a high calcium kiln. It also reveals that the low dolomite kilns of today are not only low enough but that for their operating capacity they could be lower and that induced draft would be very practicable since with its use no night charging of stone would be necessary, and many other such matters. There is little wonder that magnesium oxide resists hydrations and acquires undesirable qualities, as, often in ordinary kilns, it is exposed to temperatures up to 1500 deg. F., far in excess of its true dissociating temperature.

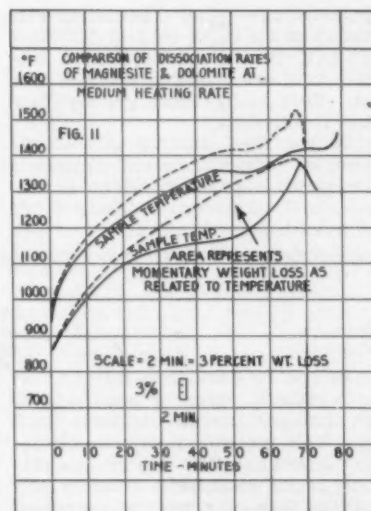


Fig. 11: Comparative rates of dissociation for magnesite and dolomite for same heating rate

The magnesia zone discovered in these studies and its temperature and extent determined, is now being very usefully applied. The direct withdrawal of the hot gases from this zone is quite practicable even with ordinary fans and recirculation of these gases to the hot zone in insulated pipes to minimize heat loss tends to lower the temperature of the hot zone without impairing either the capacity or efficiency of the kiln, and results in a far better lime. Thus, the Hot Gas Recirculating System (patented) being thermally sound, permits very low hot zone temperature without impairment of performance and permits the burning of dolomitic lime at temperatures lower than was ever practically allowable before.

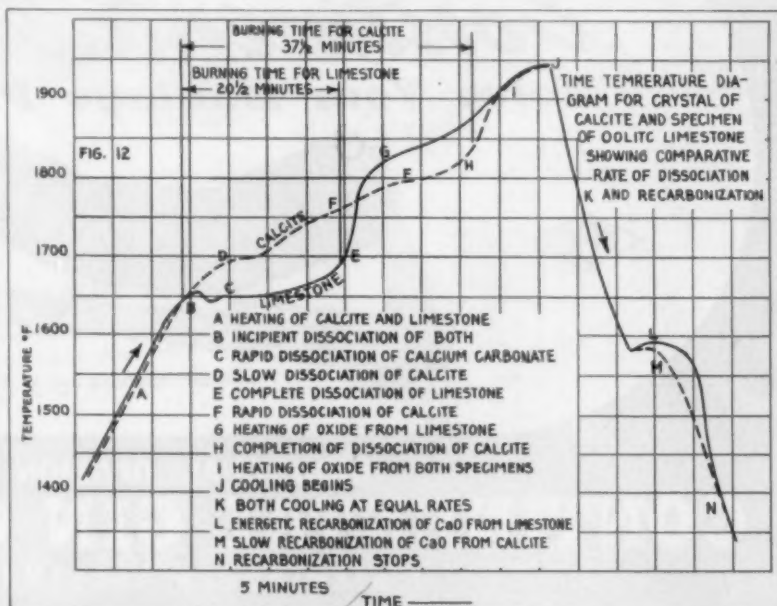


Fig. 12: Showing comparative rate of dissociation and recarbonization for crystal of calcite and specimen of oolitic limestone

## Petoskey Won't Sell Power

PETOSKY PORTLAND CEMENT CO., Petoskey, Mich., has notified the City of Petoskey that after January 1, 1946, the city must be in a position to meet its entire power needs without assistance from the cement company.

President Galster of the cement company in a letter to Mayor Perry said, "The records indicate that for some time the arrangement whereby this company supplied the city its standby power requirements was mutually beneficial to all concerned. However, since that arrangement was consummated, at least two important considerations have been increasingly asserting themselves until it is no longer a practical one which we can continue indefinitely. First, the city's overall requirements have more than doubled since our lines were connected up in 1926; second, refinements in the process of manufacturing cement which have gradually taken place during the past 15 to 20 years have increased our own power requirements approximately 30 percent.

"By Government directive, cement specifications have been somewhat modified during the war so as to afford us a small amount of relief on this score for the immediate present. We are quite certain, however, that with the war's end former standards will again prevail and we will

need for our own manufacturing processes all the power we are capable of producing."

## Kaiser Buys Gypsum Plant Site

HENRY J. KAISER CO., Oakland, Calif., has purchased in the name of Permanente Cement Co., an 11-acre tract on the Duwamish waterway near the First Avenue bridge in Seattle, Wash. Local reports state that the property is destined to be the site of the new gypsum plant which will be built for operations of Standard Gypsum Co., recently acquired.

## Liability of Tug Company

THE STEERS LAND & GRAVEL CORPORATION, New York, N. Y., with plant at Northport, L. I., recently libeled a tug and its claimant for damages to one of its sand and gravel scows resulting from the alleged negligent maneuvering of the tug while engaged in shifting operations. Decree was granted to the libellant Steers Land & Gravel Corporation vs. The Henry O'Brien, 55 F. Supp. 327.

## Increases Agstone Capacity

GARNETT ROCK CO., Garnett, Kan., has installed new pulverizing equipment to double its production of agricultural limestone which formerly was 175 to 200 tons per week.

## Oppose Pit Operation

HUGHES-KELLY CORPORATION, operator of a sand and gravel plant in East Farmingdale, Long Island, New York, has been ordered to cease operations by the Babylon Town Board under a recently enacted ordinance giving the town authority to regulate operations of sand and gravel pits. The Hughes-Kelly Corporation contends that the ordinance is unconstitutional and will fight its enforcement to the U. S. Supreme Court, if necessary.

## From Pipe to Ships

UNITED CONCRETE PIPE CORPORATION, Los Angeles, Calif., has been busy fabricating concrete ships for service in the South Pacific between the various islands. All component parts are prefabricated 38 miles away from the ship assembly line at the waterfront. This work is done at the company's plant in Baldwin Park, Calif. About 1000 men have been kept busy at this work.

## Sumatra Cement Plant Raided by Planes

PLANES from allied carriers recently bombed the big cement plant at Indaroen, Sumatra, near Padang. This former Dutch East Indies plant has been used by the Japanese to supply cement for fortifications in the occupied area.



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Canada Crushed Stone, Ltd. ....	.10	Sept. 20
Kelley Island Lime & Transport Co. ....	.20	Sept. 30
Pennsylvania-Dixie Cement Corp. #7 pfd. A (np) (ar-rears) .....	.50	Sept. 15
Pennsylvania Glass Sand Corp. ....	.25	Oct. 1
Pennsylvania Glass Sand Corp. pfd. ....	1.25	Oct. 1
U. S. Gypsum Co. ....	.50	Sept. 15
U. S. Gypsum Co. 7% pfd. ....	1.75	Sept. 15

PENNSYLVANIA GLASS SAND CORPORATION, Lewistown, Penn., report a net profit of \$278,746 for the first six months ended June 30, 1944, which compares with a net profit of \$312,669 for the six months ended June 30, 1943.

PACIFIC PORTLAND CEMENT CO., San Francisco, Calif., reports a net income of \$3836 for the six months' period ending June 30, 1944. A comparative period one year ago showed a net income of \$275,954. President J. A. McCarthy explained the severe drop in income as being due to a much lower rate of operation, Bu-

reau of Mines figures for cement shipments showing decreases of 45 percent for Northern California and 41 percent for Oregon. It was also announced that the company's lease and agreement with the Standard Gypsum Co. had expired.

WARNER Co., Philadelphia, Penn., has announced that stockholders of the company have approved the refunding plan which includes an issue by the company of a new 15-year \$4,000,000 4 percent mortgage to Penn Mutual Life Insurance Co., referred to in August Rock Products. The plan also includes the refunding of the presently outstanding 6 percent bond issue of \$3,534,000, due 1951, as well as short-term lien of \$345,000 on properties owned by its subsidiary, American Lime & Stone Co. The refunding will reduce interest charges by approximately \$70,000 a year.

NORTH AMERICAN CEMENT CORPORATION, New York, N. Y., reported a net loss, after depreciation, depletion, taxes and interest, but before profit on bonds purchased, of \$447,756 for the twelve months' period ended June

30, 1944. The net loss for a like period ended June 30, 1943 was \$246,133.

ARUNDEL CORPORATION, Baltimore, Md., had a net profit of \$217,637 for the six months ended June 30, 1944, before federal and state income taxes. This compares with a net income of \$1,089,429 for the first six months in 1943.

UNITED STATES GYPSUM CO., Chicago, Ill., presented the following earnings statement for the six months ended June 30:

	1944	1943
Operating profit .....	\$5,035,041	\$6,648,245
Deprec. & depletion .....	1,135,402	1,310,203
Net operating profit .....	3,899,640	5,338,042
Other income .....	254,626	248,772
Total income .....	4,154,265	5,586,814
Fed. anti-trust exp. ....	126,999	90,989
Income & prof. tax .....	1,933,000	3,027,000
Excess prof. tax cred. cr	76,000	177,000
Net income .....	2,170,266	2,645,825
Preferred dividends. ....	273,777	273,777
Common dividends. ....	1,197,140	1,196,772
Surplus for period. ....	699,349	1,175,276
Earnings, pfd. share .....	\$27.74	\$33.82
No. of pfd. shares. ....	78,222	78,222

Note: Renegotiation for year 1942 resulted in determination that no excessive profits were realized. Company states that there is no reason to believe outcome of renegotiation for years 1943 and 1944 will be different.

LONE STAR CEMENT CORPORATION, New York, N. Y., reported the following consolidated earnings for the six months ended June 30:

	1944	1943
Sales .....	\$13,443,324	\$15,178,582
Cost of sale .....	8,926,687	8,954,680
Selling, etc., exp. ....	1,329,727	1,365,348
Deprec. & deplet'n .....	992,948	1,114,237
Operating profit. ....	2,193,962	3,744,317
Other income .....	215,564	181,431
Total income .....	2,409,526	3,925,748
Inc. & profits tax. ....	568,878	1,803,751
Other taxes .....	533,015	412,906
*Miscel. charges. ....	315,321	337,203
Net profit .....	992,312	1,371,888

\*Includes provision for doubtful account and contingencies.  
Note: Results of foreign subsidiaries included above are figured at average exchange rates, except as to provision for depreciation and depletion, which is based on dollar value of fixed assets at time of acquisition.

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PORTABLE PLANT  
MAKES CONCRETE  
ON THE JOB



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Aggregators • Buckets • Concrete Plants • Traveling Cranes

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SAND—GRAVEL

Single and double roll and jaw crushers, hammer mills, super dry pans, steel log washers and scrubbers, sand drags, revolving and vibrating screens, elevators, conveyors, dryers, jigs, bolsters. Complete portable, semi-portable and stationary crushing, screening and washing plants for different capacities of any materials.

**McLanahan & Stone Corporation**  
Established 1883  
Hollidaysburg, Pennsylvania



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**PLYMOUTH LOCOMOTIVE WORKS**

Division of The Fate-Roth-Heath Co. • PLYMOUTH, OHIO, U. S. A.



**AMERICAN POTASH & CHEMICAL CO.,** Los Angeles, Calif., a concern seized in 1942 by the federal government because 90.79 percent of the stock was held by Germans acting through investors in the United States, will be sold by the Alien Property Custodian, 479,726 shares of capital stock being involved. The company's plant is situated at Trona, Calif.

**CONSOLIDATED SAND & GRAVEL, LTD.,** Toronto, Ont., Canada, presented the following income account for the years ended March 31:

	1944	1943
Operating profit .....	\$59,259	\$88,326
Depreciat'n and deplet'n .....	39,865	30,619
Net operating profit .....	19,394	57,707
Other income .....	10,799	10,601
Total income .....	30,193	68,308
Income and profits tax .....	12,730	44,687
Post-war tax credit .....		cr 4,200
Net income .....	17,463	27,821
Preferred dividends .....		25,200
Surplus for year .....	17,463	2,621
Previous earned surplus .....	3,005	384
Earned surplus, 3-31 .....	20,467	3,005
Earned, preferred share .....	\$3.04	\$4.42
*Earned, common share .....	d 0.32	d 0.23
No. of preferred shares .....	5,750	6,300
No. of common shares .....	70,000	70,000
*Disregarding preferred arrears.		
†Excludes \$11,526 (1943, \$24,816) charged to capital surplus.		

**KENTUCKY STONE CO.,** Louisville, Ky., paid 5 percent July 1, 1944, on general income 5s, 1956 to holders of record June 19.

**CERTAIN-TEED PRODUCTS CORPORATION,** Chicago, Ill., has announced that directors have approved a program for retirement of outstanding 67,373 shares of \$100 par 6 percent cumulative prior preference stock, on which accumulated unpaid dividends amounted to \$43.50 a share as of June 30. To effect this change, the directors have authorized issuance of an additional 374,660 \$1 par common shares, representing the balance of authorized but unissued common stock. The company has offered to exchange new common for preference stock, up to a maximum of 18,733 preference shares, on the basis of 20 common shares for each preference share. The offer expires August 21, 1944.

**KENTUCKY ROCK ASPHALT CO.,** Louisville, Ky., paid a 1% percent fixed interest payment on July 1, and had paid on April 1, 1% percent contingent interest on first 3 1/4s-6 1/2s, due 1945.

### Buy Quarries

**LEONARD FRY,** crushed limestone producer on Route 1, Mercersburg, Penn., recently purchased two additional quarries, and plans are under way to set up plants, supplementing present production.

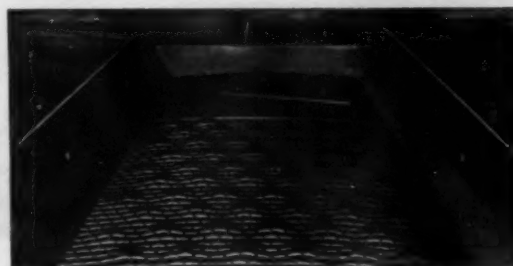


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Flattened Strand  
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## Sentinels of Safety Winners

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### Non-Metallic Mines

Sugar Creek limestone mine, Independence, Jackson County, Mo., Missouri Portland Cement Co.

No. 3 gypsum mine, Southard, Blaine County, Okla., United States Gypsum Co.

Ironton limestone mine, Ironton, Lawrence County, Ohio, Alpha Portland Cement Co.

Riverside limestone mine, Riverside, Riverside County, Calif., Riverside Cement Co.

Quincy limestone mine, Quincy, Adams County, Ill., Marblehead Lime Co.

Wampum limestone mine, Wampum, Lawrence County, Penn., Medusa Portland Cement Co.

Manheim limestone mine, Manheim, Preston County, W. Va., Alpha Portland Cement Co.

### Quarries

Bessemer limestone quarry, Bessemer, Lawrence County, Penn., The Bessemer Limestone & Cement Co.

Knoxville limestone and shale quarry, Knoxville, Knox County, Tenn., Volunteer Portland Cement Co.

Dononah dolomite quarry, Bessemer, Jefferson County, Ala., Tennessee Coal, Iron & Railroad Co.

Billmeyer dolomite quarry, Bainbridge, Lancaster County, Penn., J. E. Baker Co.

Hanover limestone quarry, Hanover, York County, Penn., Bethlehem Steel Co.

Indiana State Farm limestone quarry, Putnamville, Putnam County, Ind., Indiana State Farm.

Naginey limestone quarry, Naginey, Mifflin County, Penn., Bethlehem Steel Co.

No. 3 limestone quarry, Richard City, Marion County, Tenn., Penn-Dixie Cement Corp.

Ft. Bellefontaine limestone quarry, St. Louis, St. Louis County, Mo., Missouri Portland Cement Co.

Ohio dolomite quarry, Millersville, Sandusky County, Ohio, operated by The J. E. Baker Co.

LeRoy limestone quarry, LeRoy, Genesee County, N. Y., operated by The General Crushed Stone Co.

Northampton cement-rock quarry, Northampton, Northampton County, Penn., Universal Atlas Cement Co.

Mason City limestone and clay quarry, Mason City, Cerro Gordo County, Iowa, Lehigh Portland Cement Co.

Clinchfield limestone quarry, Clinchfield, Houston County, Ga., Pennsylvania-Dixie Cement Co.

Rock Hill limestone quarry, Quakertown, Bucks County, Penn., Crushed Stone Co.

Dexter No. 4 cement-rock and limestone quarry, Nazareth, Northampton

County, Penn., Pennsylvania-Dixie Cement Corp.

Oglesby limestone quarry, Oglesby, LaSalle County, Ill., Marquette Cement Manufacturing Co.

Sylvania limestone quarry, Sylvania, Lucas County, Ohio, Medusa Portland Cement Co.

Little Hill and Wet Weather limestone quarry, Riverside, Riverside County, Calif., Riverside Cement Co.

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Marquette limestone quarry, Cape Girardeau, Cape Girardeau County, Mo., Marquette Cement Manufacturing Co.

Greencastle limestone quarry, Greencastle, Putnam County, Ind., Lone Star Cement Corp.

Cowell limestone quarry, Cowell, Contra Costa County, Calif., Cowell Portland Cement Co.

Woodville dolomite limestone quarry, Woodville, Sandusky County, Ohio The Ohio Hydrate and Supply Co.

Quarry No. 3 cement-rock quarry, Copley, Lehigh County, Penn., Copley Cement Manufacturing Co.

White Haven limestone quarry, White Haven, Luzerne County, Penn., The General Crushed Stone Co.

Union Bridge limestone and shale quarry, Frederick County, Md., near Union Bridge, Carroll County, Md., Lehigh Portland Cement Co.

Cementon limestone quarry, Cementon, Green County, N. Y., Alpha Portland Cement Co.

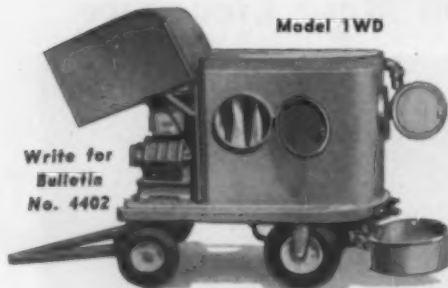
Catakill limestone quarry, Catskill, Greene County, N. Y., North American Cement Corp.

Lone Star limestone quarry, Hudson, Columbia County, N. Y., Lone Star Cement Corp.

Dallas limestone and shale quarry, Dallas, Dallas County, Tex., Lone Star Cement Corp.

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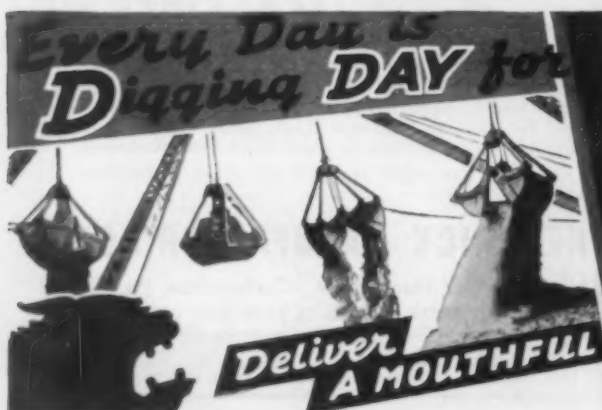
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- Eliminates wet drilling.
- Increases drilling speed up to 33%.
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**RALPH B. CARTER COMPANY**

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Bonner Springs limestone quarry, Bonner Springs, Wyandotte County, Kans., Lone Star Cement Corp.

Nazareth cement-rock quarry, Nazareth, Northampton County, Penn., Nazareth Cement Co.

Diamond limestone quarry, Middlebranch, Stark County, Ohio, Diamond Portland Cement Co.

LaSalle limestone quarry, LaSalle, LaSalle County, Ill., Alpha Portland Cement Co.

Thomaston cement-rock quarry, Thomaston, Knox County, Me., Lawrence Portland Cement Co.

Heltonville limestone quarry, Heltonville, Lawrence County, Ind., Heltonville Limestone Co.

Medusa limestone quarry, York, York County, Pa., Medusa Portland Cement Co.

Plainville No. 4 trap-rock quarry, Plainville, Hartford County, Conn., New Haven Trap Rock Co.

Fort Worth limestone quarry, Fort Worth, Tarrant County, Tex., Trinity Portland Cement Co.

Jordanville limestone quarry, Jordanville, Herkimer County, N. Y., The General Crushed Stone Co.

Stockertown cement-rock quarry, Stockertown, Northampton County, Penn., Hercules Cement Corp.

Fredonia limestone quarry, Fredonia, Wilson County, Kans., Consolidated Cement Corp.

Kirbyville limestone quarry, Lehigh County, near Evansville, Berks County, Penn., Allentown Portland Cement Co.

Birmingham limestone quarry, Birmingham, Jefferson County, Ala., Alpha Portland Cement Co.

West Conshohocken limestone quarry, West Conshohocken, Montgomery County, Penn., Valley Forge Cement Co.

Dixon limestone quarry, Dixon, Lee County, Ill., Medusa Portland Cement Co.

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Finenesses: 20 to 350 mesh

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ALLENTOWN, PENNA.

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Canal 1459



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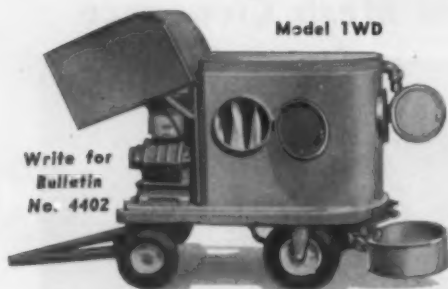
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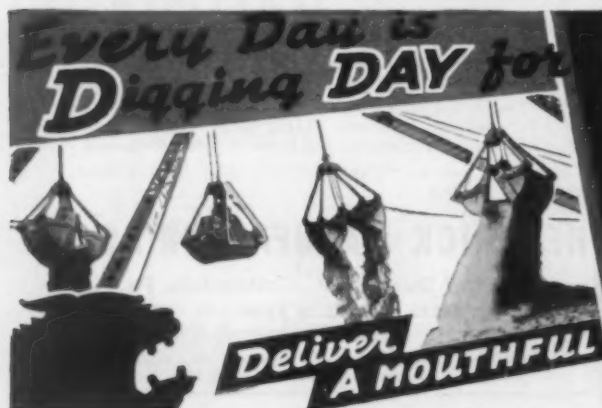
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A. R. WILFLEY & SONS, Inc. Denver, Colo., U. S. A.  
NEW YORK OFFICE: 1775 BROADWAY

## PERFORATED METAL SAND AND GRAVEL SCREENS

Manufactured exactly to your specifications  
Any size or style screen, in thickness of steel wanted with any size perforation desired.

We can promptly duplicate your present screens at lowest prices

CHICAGO PERFORATING CO.  
2437 West 24th Place  
CHICAGO, ILLINOIS  
Canal 1459

## Obituaries

(Continued from page 38)

**HARRY R. BROWN**, treasurer of the American Aggregates Corp., Greenville, Ohio, died unexpectedly at his home in Greenville. He was 63 years of age. Mr. Brown became associated with the aggregates firm, formerly the Greenville Gravel Company, in 1913.

**HENRY N. BATTJES**, president of the Grand Rapids Gravel Co., and the Lamar Pipe & Tile Co., Grand Rapids, Mich., died August 7 at the age of 53. Mr. Battjes lived in Grand Rapids all of his life. He was associated with his father, the late Nicholas Henry Battjes, founder of the gravel firm, and had been president of the company for ten years. He was a director of the National Sand and Gravel Association and the National Ready Mixed Concrete Association.

**HARRY SCOTT WHERRETT**, chairman of the board of directors of the Pittsburgh Plate Glass Co., Pittsburgh, Penn., died August 13 after a brief illness. He was 68 years of age. Mr. Wherrett had been associated with the glass company for more than 53 years, the longest service record of any employee. He was also vice-president and director of the Southern Alkali Corp.

**RUPERT KENNEDY STOCKWELL**, who was in charge of all Pacific Coast sales operations of Robins Conveyors, Inc., Passaic, N. J., passed away August 24 at his home in Oakland, Calif. Mr. Stockwell joined the company as a draftsman in 1911. The following year he left to become chief engineer for a project of the Braden Copper Co. at Rancagua, Chile, where he spent the next five years. He returned to the New York office in 1917 and became sales manager before going abroad two years later to open the Robins office in London. In 1933 he left England to spend the next four years in charge of sales for Robins in Shanghai, China. In 1937 he again returned to New York and one year later opened the San Francisco, Calif., office.

**L. R. MacKENZIE**, civil engineer of Des Moines, Iowa, died recently at the age of 61. He was formerly employed by the Portland Cement Association, following which he became consulting engineer of the former Southern Surety Co. Then he organized the American Vibrolithic Corp., of which he was president and general manager. In 1931 Mr. MacKenzie organized L. R. MacKenzie, Inc., which he headed at the time of his death.

## Pennsylvania Stone Producers Meeting

PENNSYLVANIA STONE PRODUCERS ASSOCIATION, INC., held its annual outing at the Carlisle Country Club near Harrisburg, Penn., on August 25.

## Barytes Mine Reopened

CLINCHFIELD SAND AND FELDSPAR CO., Newport, Tenn., has reopened the old Williams and Burnett mines for the mining of baryte.

## Build Products Plant

SUPERIOR CONCRETE PRODUCTS CO., Seattle, Wash., plans to build a plant 48- x 106-ft. in ground area and a story and a half in height to house office and manufacturing facilities.

## Damaged by Fire

SOUTHWESTERN PORTLAND CEMENT CO., Osborn, Ohio, recently suffered a partial loss of a large storage barn by fire. Damage was estimated at several thousand dollars.

## Increase Lime Production

LEWISTON LIME CO., Lewiston, Idaho, has increased lime production to 40 carloads per week by the addition of a new 12 ton crusher.



## "WIRE SCREENS?" SURE BILL—BUY 'CLEVELAND'-WE DO!"

Tough, Durable, Accurate Wire Screens for Vibrators or Rotary Jackets

Cleveland is the "Buy" Word of Quality

## THE CLEVELAND WIRE CLOTH & MFG. CO.

3574 E. 78TH STREET

CLEVELAND, OHIO



**Brooks**

EQUIPMENT & MFG. CO.  
KNOXVILLE TENNESSEE

You can do  
more in a  
"DAY"

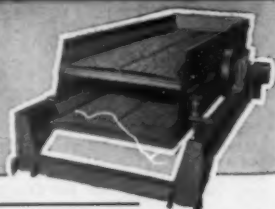
Swing Hammer  
PULVERIZER

Its wide crushing range makes it serve the purpose of two or more other types of crushers. Roller bearing equipped. Write for Bulletin.

## DIAMOND BALANCED VIBRATORS



Violent vibration for fast, positive separation all over the screen—controlled by accurately balanced design for smooth action. Long life, low maintenance costs. No choke. Fast delivery. 11 Sizes in 1-2 1/2-3-4 Decks. Tell us your needs. Write for Bulletin D42V.



DIAMOND IRON WORKS, INC.  
AND THE MAHR MANUFACTURING CO. DIVISION  
1800 NORTH SECOND ST., MINNEAPOLIS 11, MINNESOTA



## Cement Production

BUREAU OF MINES reports that production of 7,906,000 bbl. of finished portland cement during June, 1944, was 34 percent below the output in the same month of 1943; a monthly rate of decline well below the 42 percent decrease noted in May and also the lowest for any month since August, 1943. Mill shipments during June, 1944, totaled 9,350,000 bbl. or 26 percent below the mill movement in the same month of 1943. Although this monthly rate of decline was only slightly lower than in May, it was much less severe than the maximum rate—45 percent in October, 1943, reached since the downtrend started early in 1943. Total shipments during January-June were 36 percent below those in the similar period of 1943. As in April and May, the movement from mills in June, 1944, considerably exceeded production and stocks of finished cement declined 6 percent from May 31 to a total of 21,011,000 bbl. on June 30. Producers apparently are reducing stocks of emergency-specification cement and, since March 31, mill stocks have declined rather rapidly. The end-of-month stocks were 16 percent or nearly 4,000,000 bbl. below those at the close of March, 1944.

The following statement gives the relation of production to capacity, and is compared with the estimated

capacity at the close of June, 1944, and of June, 1943:

RATIO (PERCENT) OF PRODUCTION TO CAPACITY	June June May Apr. Mar.				
	1943	1944	1944	1944	1944
The month	58.0	40.0	35.0	32.0	29.0
12 months	69.0	43.0	44.0	46.0	47.0

## Pavement Yardage

AWARDS of concrete pavement for July, 1944, have been announced by the Portland Cement Association as follows:

### SQUARE YARDS AWARDED DURING JULY, 1944

Roads	807,549
Streets and alleys	422,691
Airports	2,736,075
Total	3,966,315

## Sand-Lime Brick Production and Shipments

Four active sand-lime block and brick plants reported for July and four for June, statistics for which were published in August, 1944.

### AVERAGE PRICE FOR JULY

	Plant Price	Delivered Price
Detroit, Mich.	.....	\$17.00
Saginaw, Mich.	\$15.00	.....
Grand Rapids, Mich.	.....	16.20
Seattle, Wash.	19.50	21.50

### STATISTICS FOR JUNE AND JULY

	*June	†July
Production	855,722	1,271,300
Shipments (rail)	171,000	212,000
Shipments (truck)	800,722	956,300

Stocks on hand..... 820,000 838,000  
Unfilled orders..... 950,000 1,563,000

\*Four plants reporting: incomplete, one not reporting stocks on hand and two not reporting unfilled orders.

†Four plants reporting: incomplete, one not reporting stocks on hand and one not reporting unfilled orders.

## Plan \$65,000 Plant

GLACIER SAND AND GRAVEL CO., Seattle, Wash., is planning construction of a sand and gravel plant at an expenditure of \$65,000.

## New Incorporations

North Side Sand & Gravel Co., La Crosse, Wis., has been organized to manufacture, produce and distribute sand and gravel products, etc., with a capital of 50 shares at \$50 per share. Incorporators are Harry C. Baker, Beatrice A. Baker, and Lawrence F. Young. Crosby, Schneider & Esch, La Crosse, Wis., are the agents.

George Scofield Co., Inc., Tacoma, Wash., has filed incorporation papers to manufacture and deal in cement, lime, plaster and other builders' requisites. Incorporators are J. H. Gonyea, A. J. Mitchell, and Douglas A. Gonyea, all of Tacoma, Wash. Attorneys are Eisenhower, Hunter and Ramsdell.

Standard Gypsum Co., Wilmington, Del., has been incorporated to deal in gypsum rock, clay, etc., with a capital of 30,000 shares, no par value. Principal office, Corporation Trust Co., Wilmington.

Vermont Mica Co., Inc., Montpelier, Vt., has filed affidavit to issue 40 shares of common stock at par value of \$25 per share.

## GRUENDLER CRAFTSMANSHIP

*Serving Industry over 50 Years*

### Continuous Peak Production in Cement Plants

Depends Largely on Crushing Equipment

## GRUENDLER CRUSHERS and PULVERIZERS

of heavy duty types with capacities to 300 tons per hour and larger—produce uniform fine product to increase capacities of Ball, Rod or Compeh Mills.



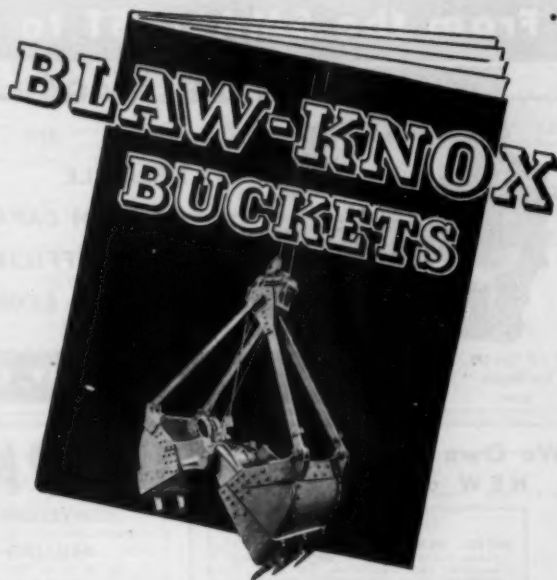
Cal-away View of Hammer Crusher  
Mfrs. of Double Roll & Hammer Crushers for Primary & Secondary Crushing

BULLETIN on large capacity HAMMER-MILLS mailed on request

## GRUENDLER

### CRUSHER and PULVERIZER CO.

2915-17 North Market St., ST. LOUIS (6), MO.



### Write Headquarters for the Catalog You Need

No. 1586—Blaw-Knox Concrete Buckets.

No. 1606—Blaw-Knox Buckets for Contractors.

No. 1696—Blaw-Knox Buckets for Single Drum Hoists for use on Railroads, Mills, Foundries, Etc.

No. 1745—Blaw-Knox Buckets for

"Burtoning" handling Nitrates, Grain, Potash, Etc.

No. 1757—Blaw-Knox 2 Line Lever Arm Buckets for Rehandling, Barge Cleanup, General Purpose, Hard Digging, Dredging.

No. 1865—Blaw-Knox 4 Rope Buckets for Coal, Ore and Cleanup.

### BLAW-KNOX DIVISION of Blaw-Knox Company

2035 Farmers' Bank Bldg., Pittsburgh, Pa.

## Manufacturers' News

R. G. LeTourneau, Inc., Peoria, Ill., has named Gordon B. McKenty as general sales manager to succeed Ed. R. Galvin, who has resigned to accept the position of president and director of the Tyson Bearing Corp., Massillon, Ohio.

Link-Belt Co., Chicago, Ill., announces the promotion of Fred A. Koepf, until recently assistant manager at Los Angeles, to the position of district manager for the northwest Pacific Division territory, with headquarters at Seattle, Wash. George T. Lundquist, formerly assistant



Fred A. Koepf



George T. Lundquist

to H. V. Eastling, vice-president and sales manager, San Francisco, succeeds Mr. Koepf as assistant manager at Los Angeles. Mr. Koepf joined the company in 1923, when Link-Belt purchased Meese & Gottfried, by whom he was then employed. Mr. Lundquist began his service with the company in 1925 at the San Francisco plant.

The Jaeger-Lembo Machine Corp., Corona, Long Island, N. Y., has purchased the building and property consisting of 25,000 sq. ft. at the corner of 127th St.

and Northern Blvd., Corona, Long Island, because of the acquisition of new lines they will sell immediately after the war.

E. I. du Pont de Nemours & Co., Wilmington, Del., announces the appointment of Edward B. Yancey, general manager of the Explosives Department, as vice-president and member of the executive committee. H. F. Brown, general superintendent of the department, becomes assistant general manager, succeeding W. H. Ward who took Mr. Yancey's place. P. J. Kimball, manager of the explosives division, becomes general superintendent. F. R. Wilson, formerly director of production of high explosives, becomes manager of the explosives division. J. H. Wellford, who was general assistant to management in the explosives department, will be associated with Mr. Yancey.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., announces that Frank C. Angle, manager of sales activities in the Pacific region, has been appointed manager of all field sales offices of the General Machinery Division and their operations. He will continue to supervise operations of the Pacific region.

The Timken Roller Bearing Co., Canton, Ohio, has appointed R. G. Wingerter as assistant chief engineer for the industrial division. For the past six years Mr. Wingerter has been industrial engineer for the company.

Timber Engineering Co., Inc., Washington, D. C., announces the opening of a San Francisco service and sales office to assist architects and engineers on war and private projects. Alden K. Smith has been appointed service and sales manager for the Pacific Coast States.

Hyster Co., Portland, Ore., has named Donald Foster of Portland, Ore., as the new Chicago branch manager, with offices in the La Salle Wacker Building, 221 N. La Salle St. C. C. Dunham, for-

mer Chicago manager, will go to the Hyster Portland factory as personnel manager.

The Elmc Co., Salt Lake City, Utah, has announced the addition of a new branch office in the Paul Brown Building, St. Louis, Mo. This new branch will be under the management of James K. Russell.

Iowa Mfg. Co., Cedar Rapids, Iowa, announces that Frank P. D'Aquila, well-known lecturer-author on Latin American relations, has been named export sales manager.

The American Fork & Hoe Co., Cleveland, Ohio, announces that Arch Milligan, inventor of the one-piece forged shovel, is retiring as manager of the Dunkirk Works after 50 years devoted to the making of shovels and improving their design and construction. Mr. Milligan developed the patented process of forging shovels in one piece from a solid bar of steel.

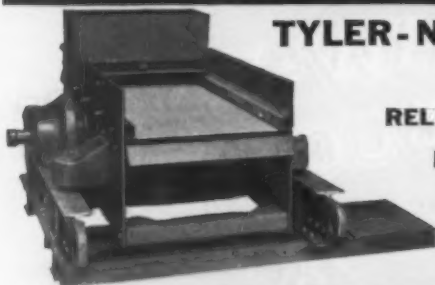
Athey Truss Wheel Co., Chicago, Ill., has elected B. F. Lease, sales manager, as vice-president in charge of sales, advertising and service. Mr. Lease started with Athey in 1931 as special representative, with rapid advancements to district representative; manager, service and research; manager domestic sales and now vice-president of the firm.

Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., Passaic, N. J., has received the National Advertising Agencies Network First Award for its "Employee Relations Program." The company was awarded second prize for this program last year, and received first prize for Best Business Paper Advertising Campaign for the past three consecutive years. It has the Army-Navy "E" with Star and Treasury "T". Last year it also received the highest award from the National Victory Garden Institute for its Victory Garden project.

## From the SMALLEST to the LARGEST TONNAGES

### TYLER-NIAGARA SCREENS

are  
RELIABLE  
HIGH CAPACITY  
EFFICIENT  
ECONOMICAL



2' x 4' Type 100  
Tyler-Niagara  
Screens



6' x 14' Type 900  
Tyler-Niagara Screens

THE W. S. TYLER COMPANY, Cleveland 14, Ohio

We Own and Offer  
NEW and USED

## EQUIPMENT

**SPECIAL**  
DIESEL GENERATOR SET—300 HP. Fairbanks-Morse Diesel, 6 cylinder, Model 32 complete with auxiliaries, 257 RPM, direct connected to a 250 KVA Fairbanks-Morse generator, Type D, 3 phase, 60 cycle, 220 volts, V-Belt Drive to Exciter. Complete with panel boards, etc.  
ROTARY CONVERTER—1000 KW Westinghouse, Transformer and auxiliaries.  
TURBINE—100 HP, Westinghouse 2700 RPM gear reduction, 3-1.  
AIR COMPRESSOR—I. R. Duplex, 100 HP, motor and receiver. Capacity 582.  
STEEL GUY DERRICK—110' mast 90' boom—2 drum Clyde hoist, electric.

### CRANES & SHOVELS

- 1—P. & H. 1-yd. SHOVEL, Gasoline, Reconditioned.
- 1—Marion 32 Steam 1½-yd. SHOVEL.
- 1—LOCOMOTIVE, 4-wheel, 10 ton, 25' boom, Brown Hoist Co.
- 1—OVERHEAD, 10 ton, 74'4" span, air operated.

### CONVEYORS & ELEVATORS

Various sizes.

### DRILLING EQUIPMENT

- 1—No. 40 I. R. Drill sharpener.

### COOLERS & DRYERS

- 1—3½ x 40 ft.
- 1—7' x 56'.
- 1—10 x 90 ft., and others.

### CRUSHERS

All types, various sizes.

### ELECTRIC MOTORS

Large stock, rebuilt, AC or DC.

## WANTED

DIESEL AND GENERATING EQUIPMENT  
CEMENT MANUFACTURING EQUIPMENT

## WEBBER EQUIPMENT CO.

17 East 45th St.

MU. 2-6511

New York 17, N. Y.

### FEEDERS

- 2—BAILEY FEEDERS, Type No. 2, complete with steel hoppers, 8½ ft. dia. x 12 ft. cone bottom.

### GRINDING EQUIPMENT

- 1½ x 20 ft. TUBE MILLS, F. L. Smidth Co.
- 2 x 22 ft. TUBE MILL.
- 2 x 10 ft. TUBE OR BALL MILL.
- 1—4-roll RAYMOND MILLS.

### KILNS

- Vulcan 7' x 120', like new. And other sizes.
- 1—8 x 9½ x 180 ft. And others.

### SYNCHRONOUS MOTORS

- 1—1500 HP, 25 cycle, 2280 V.
- 2—1250 HP, 25 cycle, 2280 V.

### TANKS

Up to 55,000 bbls.

"In Business Papers  
... Look for this  
Seal of Integrity."



A national association of business  
publications devoted to increasing  
their usefulness to their subscribers  
and helping advertisers get a  
bigger return on their investment.

Caterpillar Tractor Co., Peoria, Ill., announces that Albert Olson, owner of Albert Olson Co., Ltd., is retiring after representing Caterpillar in the Saskatchewan territory for almost 20 years, and that the firm of Kramer-Church Tractor Co., Ltd., would represent the company in this territory, with headquarters in Regina.

Union Carbide and Carbon Corp., New York, N. Y., announces that E. E. LeVan has been elected president of Haynes Stellite Co., Kokomo, Ind., a unit of Union Carbide and Carbon Corp., succeeding the late Francis P. Gormely.

H. K. Porter Co., Inc., Pittsburgh, Penn., has announced the purchase of Fort Pitt Steel Casting Co., McKeesport, Penn., manufacturers of pressure and alloy steel castings.

Whiting Corp., Harvey, Ill., announces appointment of the Cardinal Supply & Mfg. Co., 427 Sunderland Bldg., Omaha, Neb., as its exclusive sales representative in the Omaha territory comprising Nebraska and western Iowa.

Mack Trucks, Inc., New York, N. Y., announces the appointment of the following district managers: E. W. Turnbull, formerly assistant manager in the northeastern division, takes over the Akron branch as district manager, while E. W. Atherton, formerly manager in Akron, assumes the duties of district manager in the division's Albany branch. J. A. Basile, formerly a marine engine salesman in the southern division, is now district manager of the New Orleans branch.

United States Rubber Co., New York, N. Y., has named Clarence L. Wanamaker as general manager of the munitions division, to succeed Ernest G. Brown, recently chosen general manager of mechanical goods, general products and "Lastex" yarn and rubber thread divisions.

# RYERSON STEEL <sup>IN STOCK</sup>

Call Ryerson when  
you need steel — any kind, shape,  
or size. Large stocks are available  
at ten convenient plants. Ask for  
a Ryerson Stock List — your guide  
to quick shipment of steel.

#### Principal Products Include:

Bars • Shapes • Structural • Plates • Sheets  
Floor Plates • Alloy Steels • Stainless Steel  
Shafting • Screw Stock • Wire • Mechanical  
Tubing • Boiler Tubes • Reinforcing Steels  
Tool Steels • Bobbitt • Nuts • Bolts • Rivets  
Welding Rod • Etc.

**JOSEPH T. RYERSON & SON, Inc.**

#### Plants at:

CHICAGO, MILWAUKEE, ST. LOUIS, DETROIT,  
CINCINNATI, CLEVELAND, BUFFALO, BOSTON,  
PHILADELPHIA, JERSEY CITY

## Classified Advertisements

**POSITIONS WANTED — POSITIONS VACANT**  
Set in six-point type. Minimum \$1.00 each  
insertion, payable in advance.

**INFORMATION**—Box numbers in care of our  
office. An advertising inch is measured verti-  
cally in one column. Three columns, 30 inches  
to the page.

**CLASSIFIED**—Displayed or undisplayed. Rate  
per column inch, \$5.00. Unless on contract  
basis, advertisements must be paid in  
advance of insertion.

### FOR SALE

**RAILS NEW AND RELAYING  
TRACK ACCESSORIES**  
from 5 Warehouses  
**L. B. FOSTER COMPANY**  
PITTSBURGH • CHICAGO • NEW YORK

**STEAM SHOVELS**  
Definitely in A No. 1 Condition  
Rightly priced  
Model No. 78—3½ yards  
Model No. 300—4 yards  
We solicit inquiries for smaller size shovels, drag-  
lines, etc., in gasoline and diesels.  
**A. JAY HOFMANN**  
Plant, Mine and Mill Equipment  
Narberth, Penna.

**FOR SALE**  
Approximately 6,000 12x16  
steel cored pallets  
**CONCRETE & CINDER BLOCKS  
PRODUCTS CO.**  
10 Buell Rd. Rochester 11, N. Y.  
Genesee 2121

### New—RAILS—Relaying ALL SECTIONS

Also contractors' equipment, "V" shaped and  
Western cars, 24 and 36-in. gauge, portable track,  
gas loco, frogs and switches. Attractive prices  
quoted. Wire, write or telephone for quotations.  
**M. K. FRANK** 480 Lexington Ave.  
Park Bldg. New York, N. Y.  
Pittsburgh, Pennsylvania Hiltz Bldg.  
Havana, Cuba Reno, Nevada

### FOR SALE

1—21"x42" Single Roll McLanahan Crusher. Good  
shape. Extra set of fine segments. 15 V-belts.  
1—PA 58 International Power Unit. Like new.  
1—7"x12" Universal Crusher. New pitman, shaft  
and bearings.  
Write Box B-77, c/o Rock Products,  
309 W. Jackson Blvd., Chicago 6, Illinois

### FOR SALE

1—Bosser Semi-Automatic Tamper and Drag  
Elevator.  
1—Portland 12 Cu. Ft. Mixer.  
2,000—8½ x 18 Steel Pallets.  
40—Chase Racks (Steel).  
**V. PATURZO, BRO. & SON**  
800 N. Haven St. Baltimore 5, Md

### RELAYING RAILS

Angle Bars Tie Plates  
All Track Accessories  
**Midwest Steel Corporation**  
Charleston, W. Va.

### PULVERIZERS

One (1)—Sturtevant Vertical Emery Mill, new  
emery stones recently. Price \$675.00  
Four (4)—Kent Maxcon Ring Roll Mills, in  
good running condition, may be seen in opera-  
tion. Price, each, \$1675.00  
One (1)—Bradley 3 Roll Pulverizer. Price, \$1150.00

**WHITEROCK QUARRIES**  
Belleville, Penna.

### FOR SALE

Guaranteed used Steel Pipe  
and Boiler Tubes  
Wood and Steel Tanks  
Buildings, Valves and Fittings  
**JOS. GREENSPON'S SON PIPE CORP.**  
Natl. Stock Yds., St. Clair Co., Ill.



## FOR SALE

### USED EQUIPMENT AVAILABLE NOW

#### GYRATORY CRUSHERS

- 3—Gates No. 6.
- 2—Gates No. 5.

#### ROTARY KILNS

- 3—8'6" x 7'6" x 125'.
- 1—7'6" x 7' x 125'.
- 3—5'6" x 5' x 60'.

#### ROTARY DRYERS

- 5—5'6" x 5' x 60'.
- 1—5' x 30'.

#### PULVERIZERS

- 8—42" Fuller Lehigh.
- 1—30" x 24" Jeffrey Type A.

#### FULLER-KINYON PUMPS

- 2—4" and one 8". Also Valves.

#### SCREENS

- 4—3' x 5' Hummer Double Deck.

#### MILLS

- 1—Allis Chalmers Compeb 8' x 7' x 45'.
- 1—Smith Tube 5'6" x 22'.
- 4—Krupp No. 8 Ball.

#### CENTRIFUGAL PUMPS

- 3" to 18" Motor and Turbine Drive.

#### LOCOMOTIVES

- 1—20 ton G. E. Std. Gauge Elec.
- 1—8 ton Vulcan Std. Gauge Gas.

#### SPEED REDUCERS

- 6—Jones Herringbone 93.5 to 1—50 HP.

#### ELEVATORS AND CONVEYORS

- Bucket—all sizes.
- Belt—all sizes.
- Screw—8" to 16".

#### BINS

- All sizes from 230 cu. ft. to 35,000 cu. ft.

#### STEEL BUILDINGS

- 10 from 20' x 40' to 110' x 530'.

**PARTIAL LIST ONLY  
SEND US YOUR REQUIREMENTS  
IF THEY ARE NOT LISTED**

All This Equipment is Owned by Us and  
May Be Inspected of Phillipsburgh, N. J.

### HEAT AND POWER COMPANY

Algonquin 4-3874  
45 BOND STREET NEW YORK 12, N. Y.

### SPECIALS!

- 3—Allis-Chalmers Crushing Rolls, 36" x 15", 28" x 15".
- 2—Blake Jaw Crushers, 10" x 20", 9" x 15".
- 1—Single Roll Crusher, 18" x 16".
- 2—Oliver 5' x 8', 8' x 8', Rotary Continuous Filters.
- 10—Bucket Elevators, 30' to 75'.
- 8—Belt Conveyors, 20' to 50'.
- 5—Rotary Kilns or Dryers, 7' x 120', 6' x 60', 6' x 42', 4' x 40'.
- 2—Raymond Mills, 4 and 5 Rolls.
- 5—Tyler Screens, 3' x 5', 4' x 5'.
- 2—Jeffrey Type "A" Hammer Mills, 36" x 24", 24" x 18".
- 1—Fuller Kinyon Pump, 6" suction and discharge, motor driven.

Partial List Only. Your  
Inquiries Solicited.

**BRILL Equipment Co.**  
225 WEST 34th STREET, NEW YORK 1, N. Y.

#### AIR COMPRESSORS

BELTED: 355, 528, 676, 1000, 1200 & 1870 Ft.  
ELECTRIC: 478, 676, 807, 1302, 1723 & 2300 Ft.  
DIESEL: 608, 807 & 1000 Ft.  
PORTABLE GAS: 110, 160, 220, 310, 540 & 1800 Ft.  
STEAM: 40, 120, 150, 1800, 2300 & 3600 Ft.

CLAMSHHELL BUCKETS, SKIPS & GRAPPLES  
Owen B & H Stone Grapple.  
2 Yd. OWEN Type 8 Material Handling.

1 1/2 Yd. 1 Yd. & 1/2 Yd. HAYWARD Class E.  
18 Steel Skips 6 1/2 x 8 x 2 1/2.  
5 Ton Bucyrus Rock Crane.

#### CRANES AND DRAGLINES

1—16 Yd. 100' Boom Electric Caterpillar Drag-  
line.  
1/2 Yd. 5 Ton O & S 30 Ft. Boom.

12 Ton NORTHWEST 50 Ft. Boom Gas.  
20 Ton LIMA 750 Diesel, 65 Ft. Boom.  
25 Ton BROWNING & 30 Ton AMERICAN Loco.  
25 Ton LINK BELT K-48 Electric, 70 Ft. Boom.

#### CATERPILLAR SHOVELS

1/2 Yd. Lima Diesel.  
2 Yd. Marion Steam Shovel.  
1/2 Yd. 1 1/2 Yd. & 4 Yd. MARION Electric.  
1 Yd. NORTHWEST Gas.

1 1/2 Yd. LIMA Diesel.  
1/2 Yd. BUCYRUS 41B Steamer.  
4 Yd. Bucyrus 120 B Electric. Also 3 yd. Erie Elec.

#### DUMP CARS

46—KOPPEL 1 1/2 Yd. 24 & 30 in. Ga. V Shaped.  
15—2 Yd. 3 Yd. 4 Yd. 6 Yd. 12 Yd. 18 Yd. 36 in. Ga.  
20—Std. Ga. 12 Yd. 16 Yd. 20 Yd. & 36 Yd. Cap.  
15—Std. Ga. 50 Ton Battiscombe Gondolas.

#### FLAT CARS

9—60 ton std. ga. heavy duty flat cars.

#### HOISTING ENGINES

Gas: 15, 30, 60, 100 & 120 HP.  
Electric: 20, 30, 60, 100 & 150 HP.  
Steam: 6 1/2 x 8, 7 x 10, 8 1/2 x 10, 10 x 12, 12 x 24.

#### DIESEL UNITS

75, 90, 180, 200 HP. P. M. Engines.  
110 HP Ingersoll Rand Engine.  
175 KVA Worthington 3/60/2300.  
275 KVA Fairbanks 3/60/2300.

#### BALL, ROD AND TUBE MILLS

5' x 22" HARDINGE CON. Dry Ball Mill.  
6' x 22" HARDINGE CONICAL Pebble Mill.  
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JEFFERY, 31x20 & No. 1 Stuartovant Ring Roll.  
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10,000 Gal., 15,000 Gal. & 30,000 Gal. Cap.  
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8, 10 and 14 Ft. Separators, Gaven & Bradley.

#### ROLL CRUSHERS

36x60 Fairmount & 36x20 Diamond.  
JAW CRUSHERS  
10x8, 12x7 1/2, 14x7, 15x9, 15x10, 16x9, 16x12, 16x10,  
18x11, 20x9, 20x6, 20x10, 20x12, 20x12, 30x15,  
30x13, 36x15, 36x20, 40x18, 36x16, 36x6,  
36x10, 36x24, 42x9, 48x34, 48x30, 60x43, 64x66,  
36x10, 9x36.

#### CONE & GYRATORY CRUSHERS

5 No. 19, 25, 37 & 49 Kennedy.  
18 in., 24 in., 30 in., 36 in. & 48 in. Symons Disc.  
4—10 T2 Traylor 4 Ft. Gyratory.  
4—Nos. 5, 3 & 6 Austin Gyratory.

2—Traylor T-13 Building Gyratory, also 16 inch  
8 in. Traylor T. Gyratory.  
17 Gates K—Nos. 3, 4, 5, 6, 7 1/4, 8, 9 1/4 & 21.  
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IDLERS: 54 in., 42 in., 36 in., 30 in., 24 in.,  
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36 in. x 20 Ft., 3 Ft. x 30 Ft., 4 Ft. x 30 Ft., 54 in.  
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Ft., 5 Ft. x 60 Ft., 6 Ft. x 60 Ft., 6 Ft. x 30 Ft.,  
6 Ft. x 70 Ft., 10x20, 1 1/2 x 100 & 110 Ft. Kilns.

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GY: 8 Ton 55 Ft. Boom, 15 Ton 100 Ft. Boom.  
20 Ton 115 Ft. Boom, 50 Ton 100 Ft. Boom.  
STIFF LEG: 5 Ton 70 Ft. Boom, 15 Ton 100 Ft.  
Boom, 25 Ton 150 Ft. Boom, 75 Ton 135 Ft. Boom.

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GASOLINE: 3 Ton 2 Tons & 3 Ton 12, 14, and 30 Ton.  
STEAM: 9 Ton, 20 Ton, 40 Ton, 60 Ton & 80 Ton.  
ELECTRIC: 3 Ton, 5 Ton, 8 Ton, 40 Ton.  
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HUMMER ROTEX, NIAGARA & ROBINS.  
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Dredge Pump 10" F. H. cent., nearly new.

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Blaw-Knox Ready-Mix Plant, 160 ton Aggregate

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Kochring 24E Dual Drum Paver.  
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Telsmith 20-B steel frame Gyratory, V-belt drive.  
Gyratory Crusher: K.V.S. 30, 27-6, 40, 33, 24.  
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 1-30"-60" center belt bucket elevator.  
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Buchanan Crusher, 12" x 36" Type B Jaw Crusher.

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42"	5	1/8"	1/16"	20"	4	1/8"	1/32"
36"	6	1/8"	1/16"	18"	4	1/8"	1/32"
30"	6	1/8"	1/16"	16"	4	1/8"	1/32"
30"	5	1/8"	1/16"	14"	4	1/16"	1/32"
24"	5	1/8"	1/32"	12"	4	1/16"	1/32"
24"	4	1/8"	1/32"				

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14" - 6	8" - 6	4" - 5
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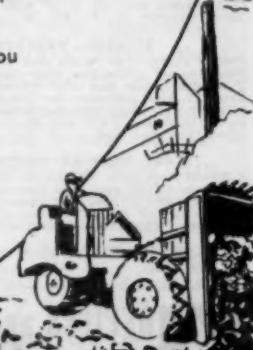
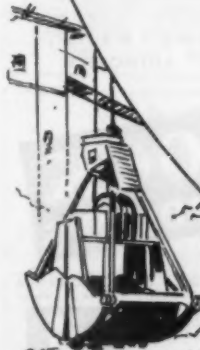
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We suggest you write to us promptly and obtain a proposal without  
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1—3 ft., with coarse bowl, spare parts.

## HARDINGE CONICAL BALL AND PEBBLE MILLS

1—5'x22", iron lined, silent chain drive.  
1—6'x36", silx lined, silent chain drive and motor.  
2—8'x30", silx lined, belt driven.

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1—2'x40" Pennsylvania Single Roll Crusher, flat belt drive.  
2—40" dia. x 10" Colorado Iron Works, smooth rolls, equipped with feeding device.

## RAYMOND PULVERIZERS

2—4 roll high side Mills complete, for extremely fine products.  
1—4 roll high side Mill, equipped with whizzer separator and latest oil type bearings.  
2—No. 40 Imp. type Mills with air separation, air handling equipment and motors.

## BELT CONVEYORS

1—20'x369" c/c Robins, ball bearing, 3-pulley type idlers, including belt, all mounted on steel supports.  
1—30'x120" flex-steamers, ball bearing idlers, complete but without belt.

## DORR CLASSIFIERS AND THICKENERS

3—Dorr Combination Bowl and Rake Classifiers:  
10' dia., with 2'3"x19'8" rake;  
12' dia., with 2'3"x21'4" rake;  
15' dia., with 2'3"x23" rake.  
3—Dorr Thickener Mechanisms, for 20' dia. x 10', 30'x12', 40'x12'.

## VIBRATING SCREENS

10—3'x5', 4'x5' Tyler Hummer, 1 and 2-decks, guaranteed good condition.

## DIRECT HEAT ROTARY DRYERS

2—4'x30' Ruggles-Coles single shell. Can also be used as Rotary Kilns.  
2—5'x40'.  
1—6'x24' Cummer, mounted on steel I-beam frame, with furnace, etc.  
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Electric motors: 1-100 hp. with starters.  
Chicago air compressor, NER, 550 CFM.  
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I-8 gasoline powered air compressor on skids.  
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Morris 60" manganese lined sand pump.  
Bilcoot 4" belt driven sand pump.  
Vertical Centr. 20 hp. Electric 6" water pump.  
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Flat cars, 24' and 30' gauge.  
400 hp. V-belt-drive pulley unit.  
Enclosed 25 hp. angle drives with roller bearings.  
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Acme 18'x36" jaw crusher.  
Buchanan Blake type jaw crusher, 10'x16".  
New England 11'x30" jaw crusher.  
Champion 12'x34" jaw crusher.  
Scholl 8'x10" jaw crusher.  
Reliance 8'x14" jaw crusher.  
Traylor "DULLDOG" 11" gyratory crusher.  
Robins double roll 24'x30" coal crusher.  
Jeffrey 24'x34" single roll coal crusher.  
Single roll 24'x24" coal crusher.  
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Two Hummer single deck 3'x5' vibrating screens.  
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